SOUTH AMERICAN EXPLORER

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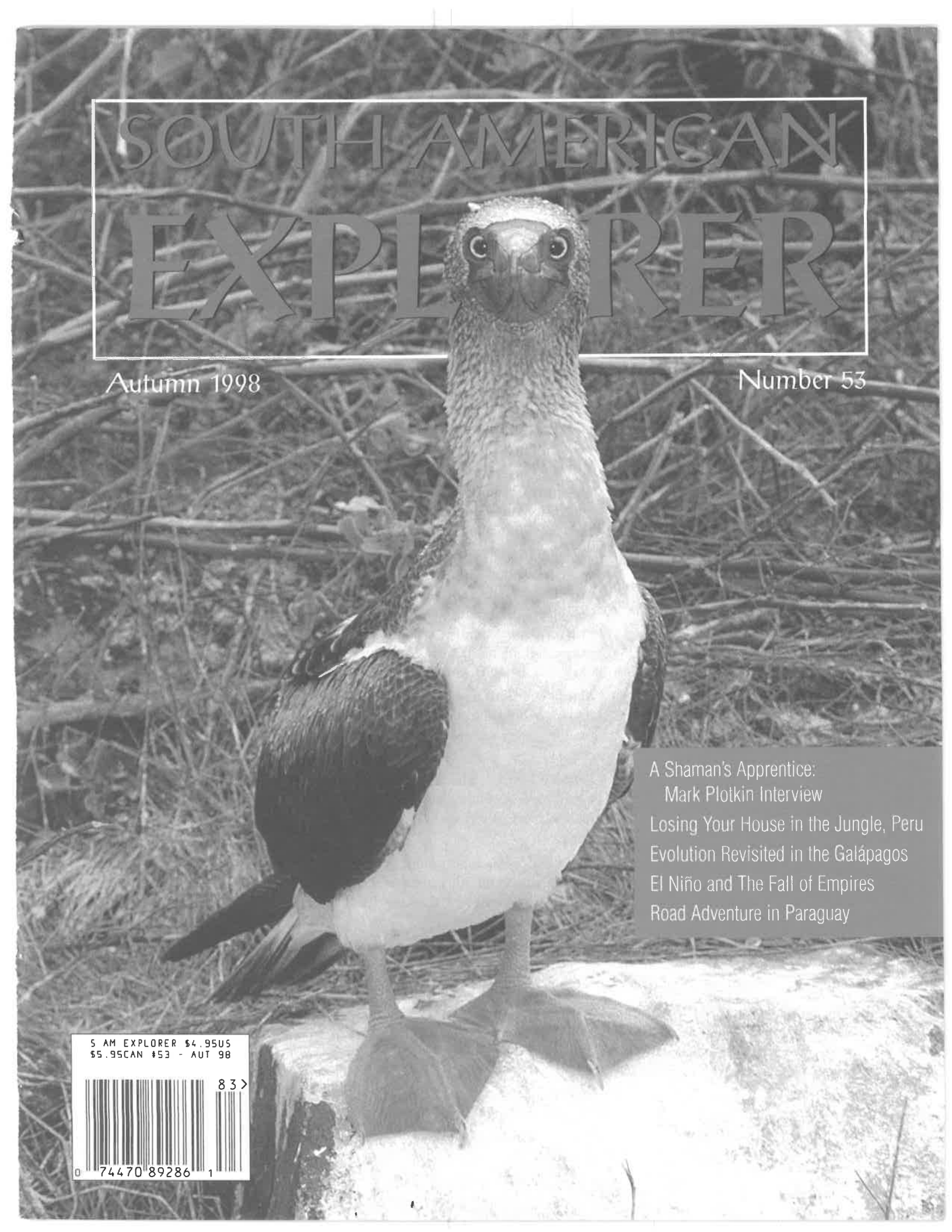

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Mark Plotkin Interview

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South American Explorers Club

The South American Explorers Club

is a 501(c)(3) non-profit organization. With Clubhouses in Quito, Ecuador, and Lima, Peru, and U.S. headquarters in Ithaca, New York, the SAEC collects and makes available to its members up-to-date, reliable information about Central and South America.

Membership is US $40 ($60 couple) per year. Residents outside the U.S. (including Canada and Mexico) add US$7 for postage. Those wishing to sign up in the United Kingdom can join through Bradt Publications (Please allow 4-6 weeks to receive membership cards), 41 Nortoft Road, Chalfont St. Peter, Bucks SL9 OLA, U.K.

Aims and Purposes:
The South American Explorers Club was founded in 1977 to:

- Further the exchange of information among travelers, outdoors people and researchers
- Support scientific field exploration and research in the social and natural sciences
- Promote field sports such as mountaineering, white water running, hiking, caving, biking and others.
- Awaken greater interest in and appreciation for wilderness conservation and wildlife protection.
- Receive contributions for projects aimed at conserving natural resources and improving social conditions in Latin America.

South American Explorer:
A 64-page quarterly magazine with articles on adventure travel, scientific discovery, history, archaeology, mountaineering, native peoples, languages, anthropology, geology, and more.

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Knowledgeable Staff: Our friendly staff and volunteers provide advice and practical information to members.

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The Club's annual catalog contains books, maps, music and language tapes. Please call or write the Ithaca office to request a copy of the latest catalog. Include $3.00 if catalog is to be mailed outside the U.S.

To join the Club: Contact us at our U.S. headquarters, use the order form on page 63, or sign up at one of the clubhouses.

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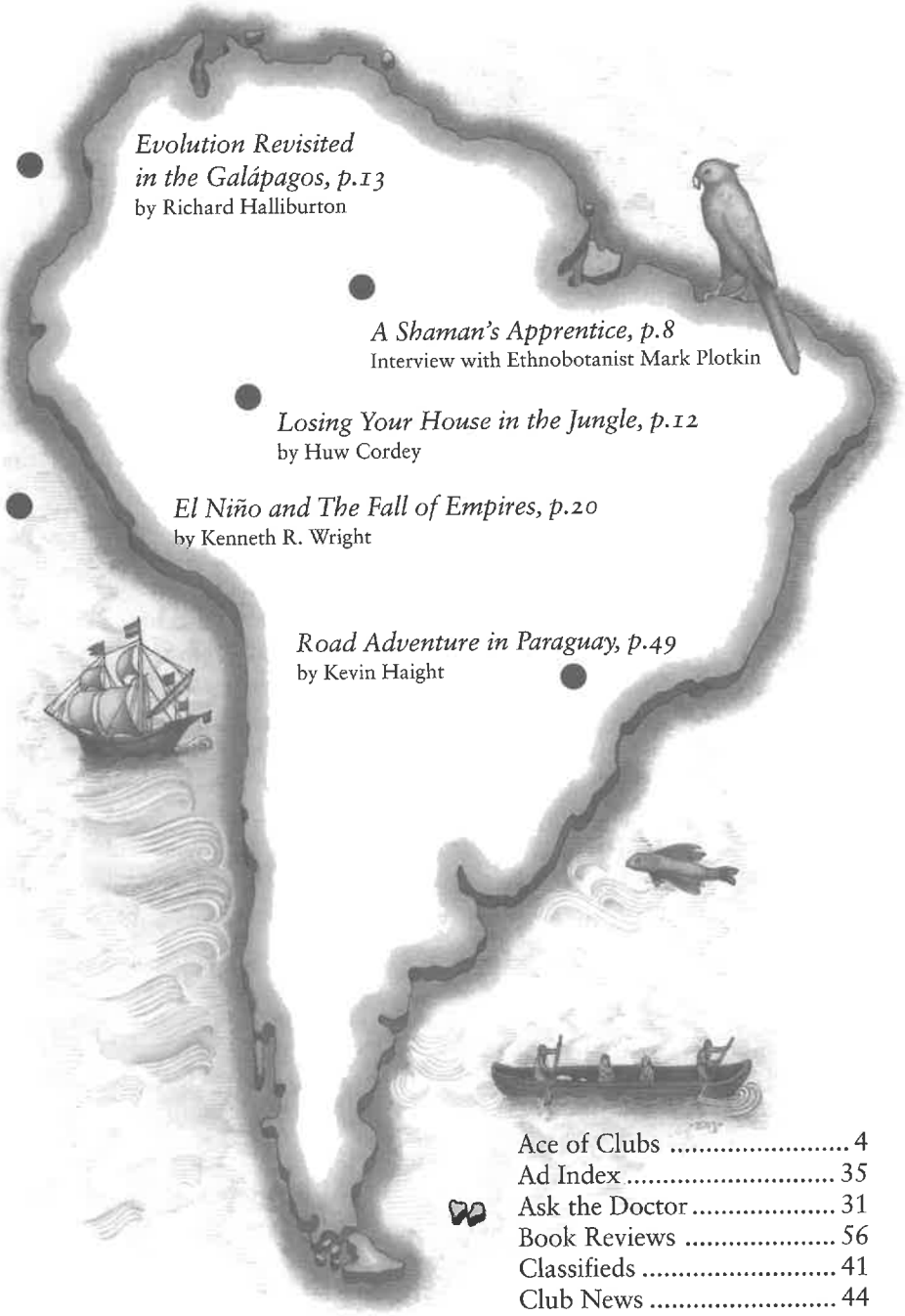

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WEDNESDAY MORNING THE INCREDIBLE HAPPENED. Just as we were e-mailing the Lima Clubhouse, the screen went blank and pages from early issues of the South American Explorer flashed on the screen...*in living color*! "So what," you say? So this! We didn't publish in color back then. The first color *SAE* ever was Issue 44.

Big deal, you're thinking. So someone got hold of some early issues, colorized the photos, and e-mailed them to the Club as a joke. That's what we thought, too...for a while. But then things *really* got weird. This morning, we got to see a 120-page *South American Explorer* with 3-D photographs dated Spring, 4004. You had to see it to believe it. The photos! It was like you could just walk into the jungle and sling a hammock between the trees, trek up the scree slopes to the summit of a majestic Ande, float on the mysteriously moving current into an unknown wilderness. And the sounds, the smells and... Oh hell—it's useless trying to describe.

Anyhow, the *SAE* from the future got our attention and prepared us somewhat for the meeting with the scaly delegation of dignitaries that beamed in later that day. And all we can say is that if you'd been on hand when it happened you wouldn't have any doubts about this being the real thing—a close encounter of the third kind.

Now, mind-melding with aliens is a little tricky to get the hang of but here's what we've learned so far: Our warty guests come from a highly advanced civilization out there beyond quasars in the cold reaches of space. When not meditating on the eternal verities they've been watching us so, of course, they know all about the Club's plans to open a Clubhouse in Cusco. More than that, they've known about the Club for centuries. Even before we existed. How's that? Well, you see our present and future is their past. So it's not just that they're a lot smarter than we are, they know everything that's going to happen here on earth because, of course, for them it's already happened. Anyway, once you grasp this, it's a lot easier to talk to them.

Members, we know you would share our admiration for these clawed ambassadors who have braved a perilous journey travelling 3048 years back in time to bring the Club important news. We can't go into all the details but, in a nutshell, here's what they have to say: Cosmically speaking, Earth has entered an extremely rare three-year 5th dimensional configuration. This means that what the SAEC does between now and the year 2000 will decide the future of Machu Picchu. Only immediate and specific action by Club members, these noble newts stress, can save this Incan treasure from a catastrophe that will take place eons from now. On the other hand, if a handful of Club members heed their dire warning from the future and rally to the cause by becoming Founding Life Members of the Cusco Clubhouse disaster can be averted.

Some of you might be saying, "Who cares? I'll have been dead for centuries before there's any threat to Machu Picchu." Well, this isn't the place to go into it, but after lengthy telepathic exchanges with these altruistic, anntenaed aliens, we could tell you a thing or two about life after death that would give you the post-mortem jitters. You think you got problems now? Just wait 'til you're dead. Our advice: Pull yourself together morally now because it's a lot harder in the next world. But more on this later.

Members, we have seen the future—actually, make that *futures* plural. Now, we don't want to sound alarmist, but the fact is, if you'd been here in Ithaca to meet these web-limbed messengers, look into their unblinking yet earnest eyes and see for yourself their haunting astroprojections of alternative futures...well, we wouldn't have to tell you what to do. These are the stark realities we saw:

Future Reality 1:

The Cusco Clubhouse gets founded and Machu Picchu is saved. Millenia from now, visitors from all quadrants in the universe transport in to leisurely stroll this historic universe-class site, marveling at the ageless stonework, entranced by the moving mystery of this sacred center, and deeply grateful to earlier generations for preserving it through time. And, of course, at the nearby Hall of Fame, built lovingly of priceless marble, space visitors pause to admire the

Continued on page 6.

To the Editor:

Two things:

1. Re: The Explorers Club imbroglio: I reckon you could either

a. Rename our beloved SAEC as the "South American EXPLORATION Club," or

b. Ignore 'em, and see if it goes away like before, or

c. Let 'em take you to court, if it comes to that, and have faith in all the obvious dissimilarities between both publications and organizations to carry the day for you.

2. Saw Daniel Gade's article ("Andean Thievery," *SAE* Issue 52). He is one of the few tenured Ph.D.'s who is a true, unaffected explorer who really knows his stuff, based upon having truly been there in the field. Having him in the *SAE* is a great accomplishment.

Best wishes,

Gregory Deyermenjian

To the Editor:

South American Explorers Club versus the Explorers Club of New York? Some relevant examples from my telephone book:

Coca Cola and Pepsi Cola.

Around the World Travel and Berry World Travel.

Grand Jewelers and Zales Jewelers.

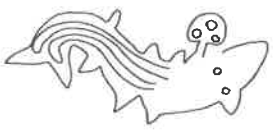
Giles Law Office and Sturgeon Law Office.

Wayne Country Club and Highland Country Club.

Tell that other explorers club to stuff it for another twenty years.

Best regards,

Stanley V. Johnson



To the Editor:

I may be just a new lawyer, which means I know just enough to get myself in trouble, but it seems to me that any claims the New York Explorers Club has against our beloved SAEC would be barred by virtue of their inaction for 20 years. In addition, the term "Explorers Club" seems rather common for protection as a trademark. Surely we have a trademark lawyer amongst our diverse ranks who would be willing to resolve this nasty affair.

Sincerely,

Chris T. Lizza

To the Editor:

I hate to dump a bucket of cold water on Professor Daniel Gade's dreary idea that the Andes are a den of sneak thievery ("Andean Thievery," *SAE* Issue 52), but here goes. During almost five years living and travelling in South America—two years in Puno, Peru in the mid-1960s, one year backpacking around the continent in the late 1970s, and innumerable one-to-two month trips, most recently to Bolivia, Argentina, and Chile, crime has darkened my path but once, and I wasn't even in the Andes. I feel deprived, cheated.

In any event, the sneak thief's accomplice is usually the victim's inattention or stupidity. Some true stories: The Brit who propped his backpack by the Huaraz bus company door while he went inside to buy a ticket. Surprise. His backpack vanished. The Australian who left cash in his luggage in a cheap hotel in Lima. Surprise. His cash walked. The French woman who parked her camera on her seat (by an open window) on the Potosí–Uyuni bus while she stretched her legs. Surprise. Her camera took flight. The American who jammed a small wad of cruzeiros in the back pocket of his swim trunks while he wandered the carnival-thronged streets of Bahia. Surprise. The wad vaporized.

The last-mentioned traveler was me. My one crime experience in five years on the road. Should I blame the Brazilian culture because my pocket got picked? I don't think so. Coincidentally, during an earlier trip to Brazil, I left my wallet on the ticket counter at the Belo Horizonte bus station. Several—count 'em—several Brazilians yelled at me, "Hey, you forgot your wallet!"

The guide books cited by Professor Gade teem with crime stories because haversackers perversely enjoy sharing their road-disaster experiences: "Juliaca is infested with crime

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Continued from page 4.
original plaque honoring the visionary SAEC Founding Life Members who back in 1998–1999 made it all possible.

Future Reality 2:

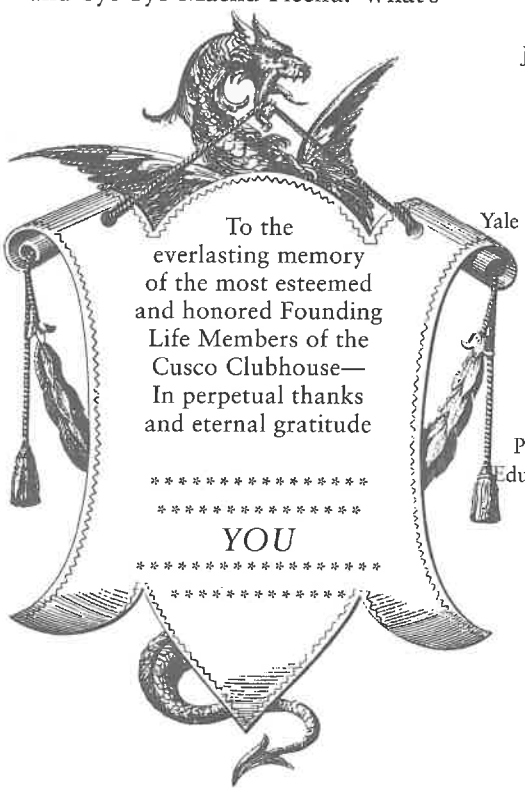
The golden opportunity to found the Cusco Clubhouse comes and goes, condemning Machu Picchu to a fate so hideous it defies description. We recoil at the shocking close ups of this venerable Incan monument smeared with graffiti, the once majestic shrine littered with the shattered radioactive rubble of mighty megaliths, the crazed and chilling shrieks of mounted motorized mutant gangs careening down the slopes, the acrid stench...You get the picture—the beastly and all too grim reality, certain to take place if we fail to meet the challenge and let the Cusco Clubhouse go unfounded...

Some of you are probably saying, "Look, the future's the future. If these leathery time travelers know the Club saved Machu Picchu, then Machu Picchu got saved and never did get overrun with mutants, so there's nothing to worry about." Good thinking, but it's not that simple.

You heard about free will, right? Well, that's why there's different outcomes, why things turn out in different ways. How to explain? Well, take gravity, for example. Remember Einstein? Then you know that gravity shapes the space around it. The denser the object, the greater the space warp. Well, it's sort of like that with free will. It's oversimplifying things a bit, but think of an ethical dilemma as if it were a moral singularity. Now the bigger the dilemma, i.e. what's at stake morally, the greater the shaping force. Without getting into the niceties of hyperspace theory, just assume that a person viewing a moral singularity (the observer) is in a position to choose to be shaped by the singularity or not. By giving in to the shaping force, that person knowingly makes a choice—to act in accordance with the will of our creator. On the other hand, every sentient being is free to choose *not* to be so shaped, i.e. free to balk, dig in, frustrate, stymie, confound, and thwart the cosmic design. Get it? Theologically speaking, it's simply a choice between good and evil.

Members, apply this to your situation. If you choose to support your Club in its efforts to open the Cusco Clubhouse, you can with confidence know that you are behaving in a manner commensurate with the divine scheme of things. On the other hand, stiff your Club at this crucial juncture and you can thank yourself for being a good part of the great cosmic problem and, worse, an impediment to its solution.

Members, the Club needs a few good Founding Life Members right now or it's bye-bye Cusco Clubhouse and bye-bye Machu Picchu. What's in it for you? For starters, you know in your heart it's the right thing to do. But there's more. Every Founding Life Member of the Cusco Club will be forever immortalized on the Cusco Clubhouse Founding Life Member Plaque. What more could you ask?



The Club wishes to thank all those members who have generously supported their Club, nobly giving that little (and not so little) extra to keep the Club flush. Our gratitude to:

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because when I got off.../Your readers should avoid Cochabamba because when I was in the market.../ Sleep chained to your backpack in Cuenca or you'll suffer what happened to me." The travelers rarely include details about their own carelessness. Even more rarely do they tell of the myriad acts of kindness bestowed on them along the trail.

Speaking of crime, here in the United States, I've been held-up at gunpoint once—in broad daylight on a busy street, no less. My apartment in Denver and my house in Washington were both burglared. My car has been busted into half a dozen times. By comparison, the Andes are a den of honesty.

Sincerely,
Daniel Buck

To the Editor:

Danel Gade's article "Andean Thievery" (*SAE* Issue 52) could be a Ph.D. thesis on the subject. May I add a few observations of my own?

My late father-in-law, a warmhearted, wonderful man, had the distinction of being robbed at least once a year for as long as I knew him. He got robbed taking the tramway, getting off the bus, sitting peacefully in the train, or just walking home. There was something about the way he walked. He'd shuffle along, absent-mindedly looking at the ground, and—abracadabra!—you guessed it, he'd get robbed.

I read an article a while back about an experiment conducted by behavioral scientists in a U.S. prison. It was in New York, I believe. The psychologists filmed a random selection of individuals walking along the street, then showed these to a group of incarcerated pickpockets, no mean psychologists themselves. When the felons were asked to pick out those pedestrians they would choose as victims, they invariably picked a certain type: my father-in-law. Not him, personally, but a sort of generic mark, a model victim.

I learned a lot from this article, and fortunately neither my wife Marlú or I have never been robbed. I did experience a near-miss once in La Paz, however, walking about with my friend. Out of nowhere, someone smeared toothpaste on our jackets. My friend was being maneuvered to do what is expected of any good victim in this case: He was just about to set down his bag and doff his jacket to deal with the stain. And sure enough, at this point, a small boy, all part of the scam, rushed up to offer us some paper to clean off the mess. Happily, in the nick of time, I realized what was going on, grabbed his bag and mine, and backed away.

We were fortunate, in a way. Our would-be robbers used toothpaste. Elsewhere, they smear the victim with eggs (e.g. in Italy where this particular ruse originated) or mustard.

I was lucky that time, but despite my vigilance, I could well be the next victim of Andean Thievery.

Federico B. Kirbus
Buenos Aires

➢

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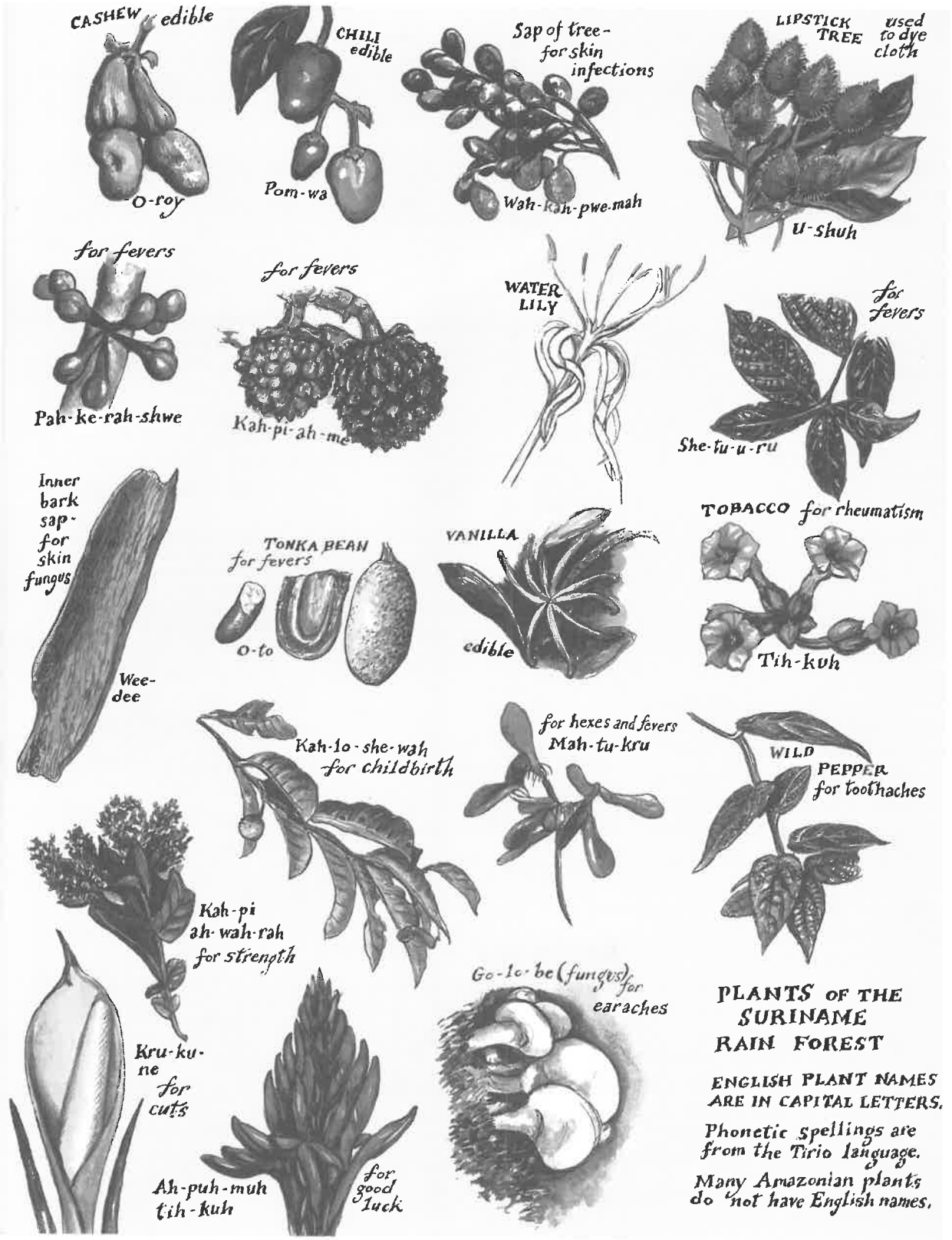
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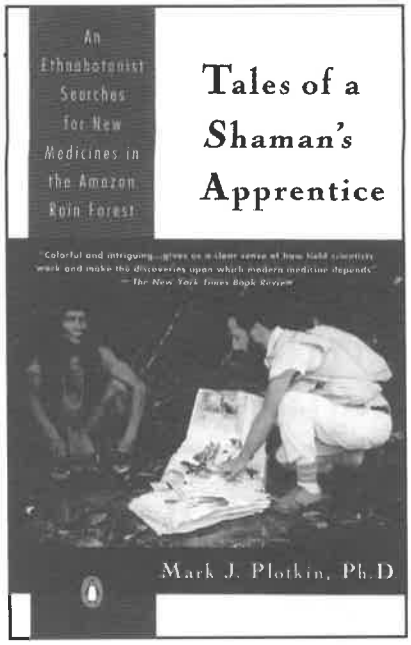
Tih-kuh
Kah-lo-she-wah for childbirth
for hexes and fevers
Mah-tu-kru
WILD PEPPER for toothaches
Kah-pi ah-wah-rah for strength
Kru-ku-ne for cuts
Ah-puh-muh tih-kuh
for good luck
Go-lo-be (fungus) for earaches
PLANTS OF THE SURINAME RAIN FOREST
ENGLISH PLANT NAMES ARE IN CAPITAL LETTERS.
Phonetic spellings are from the Tirio language.
Many Amazonian plants do not have English names.

A Shaman's Apprentice

Interview with Mark Plotkin

Illustrations by Lynne Cherry

MARK PLOTKIN is a renowned ethnobotanist who spent many years researching the traditional medicines of peoples of the rain-forest. Author of the acclaimed *Tales of the Shaman's Apprentice*, Dr. Plotkin is a research associate at the Smithsonian Institution and executive director of The Ethnobiology Conservation Team. He was featured in *Amazon*, an IMAX film.



SAE: Since *Tales of a Shaman's Apprentice*, have you written anything for publication?

MARK: I've just published a new children's book with Lynne Cherry entitled *The Shaman's Apprentice.*

I first met Lynne about 20 years ago when I was taking Schultes' classes at Harvard. I next ran into her after I took a job in Washington with the World Wildlife Fund. She showed up in my office and said, "I've got a great idea for a book about the rainforest. Is there an empty office I can use?"

Well, there was always an empty office there because people were traveling so much. And so by jumping around into a few vacant offices, she was able to produce a book on the rainforest called *The Great Kapok Tree* which is probably the best-selling children's book on the rainforest ever written. I'm a great fan of her work, her ability to communicate, her ability to get the message across to kids, and it was a real pleasure to be able to work with her on a book on ethnobotany.

SAE: Congratulations! *Amazon*, the IMAX film was nominated for an Acadamy Award. How did you like working with Loren McIntyre on this project?

MARK: *Amazon* was filmed in four countries over a six-month period—Brazil, Bolivia, Colombia and Peru. The script was written by Keith Merill who also directed the film and co-written by the great explorer/photojournalist Loren McIntyre. Merill is well-known in IMAX circles. He directed *Grand Canyon* which is one of the most popular IMAX films ever made, and of course, everyone who reads the *South American Explorer* knows Loren McIntyre. Loren has been exploring the Amazon since the 1940s and knows the basin like no one else I've ever met. Consequently, we were able to film things, places, and peoples who had seldom (if ever) been filmed before.

Loren is also the author of several wonderful books. It's a shame that a couple of them are out of print. Maybe somebody will bring these back in because these are apparently getting harder and harder to find. And of course, if you've read *Amazon Beaming*, you know that he discovered the source lake of the Amazon. It's named Laguna McIntyre in his honor.

One interesting aspect of his exploration was his encounter with the strange green monkey frogs which is recounted in that book. He saw the Indians consuming the slime from these frogs. My friend Peter Gorman at *High Times* magazine read this and decided he'd give it a whirl. He wrote a very intriguing account of this in which he talks about the fact that as soon as he took this drug, his heart rate went through the roof. He then lost all control of his bodily functions and passed out in a heap. He said, "I woke up a few hours later and felt like God, which is not a bad trade off, if you think about it."

Well, an Italian biochemist read this account and was very interested in the effect on Gorman's blood pressure. So, he looked at this stuff in the laboratory and is developing a drug for high blood pressure based on this frog extract.

SAE: Frogs? Somehow we think of you as an ethnobotanist, specializing in plants.

I'm talking about fungi. I'm talking about bacteria.

MARK: Well, you know, the search for jungle medicines has focused mostly on plants. My work with indigenous peoples is to document the utility of local plants. But what we're finding is that frogs are a treasure trove of useful compounds. In addition to the green monkey frog and its compounds that affect blood pressure, we're finding new anti-pain medicines in poison-dart frogs and new treatments for drug-resistant bacteria in African claw frogs. But frogs are becoming extinct much faster than many plants—frogs are disappearing all over the world.

I think the important point here is not just that frogs are the sources of new medicines but that *all* plants and animals are potentially useful to us and need to be protected.

I want to point out that I don't think conservation is just a utilitarian exercise—that we just protect things that we think are going to be useful to us. I don't think we have the right to extinguish things due to our own ignorance and greed. But I know that people sit up and take note when they find out how conservation benefits them in a material sense, which is why I think the medical argument about conservation is among the the most important.

SAE: What, in your opinion, is the future of exploration in Latin America?

MARK: Well, I don't expect that we're going to discover any new Machu Picchus. I do think that there are many ruins that need to be looked into further.

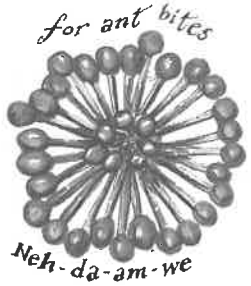
But I think the most promising and interesing future of exploration in South America is really at the micro level. I'm talking about fungi. I'm talking about bacteria.

I'm talking about plant compounds which could revolutionize the way we practice medicine, industry, and agriculture. And, of course, the most detailed knowledge of how to use these plants and animals is found among the indigenous peoples. The race is on to save the rain forest, but an even more urgent race is to document this knowledge because it's disappearing with the rainforest itself.

get together a group of kick-ass biologists

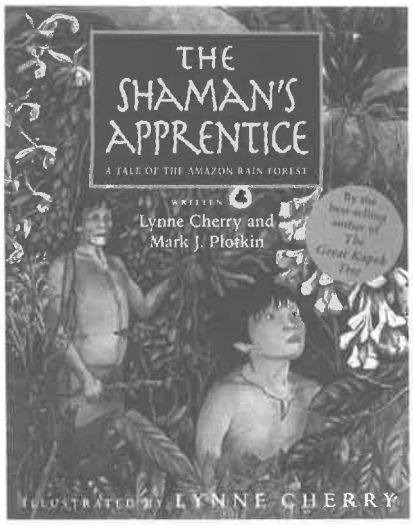
SAE: What's the Ethnobiology Conservation Team?

MARK: What we've done is get together a group of kick-ass biologists like Michael Goulding, Gary Nabhan, and Adrian Forsyth. We feel that we have a somewhat new approach to conservation and certainly a very cost-effective one. ECT is committed to a lean and efficient organization able to carry out effective conservation. We reduce costs by using the internet, fax machines, and modems—we don't cut down trees to do expensive reports. This frees up funds to go directly into the field at the crucial grass roots level. Our web page if full of this type of information. If you want to find out what we're up to, check out the webpage at www.ethnobotany.org.



SAE: Western medicine and traditional/alternative medicine—are these compatible disciplines?

MARK: No medical system has all the answers—no shaman that I've worked with has the equivalent of a polio vaccine and no dermatologist that I've been to could cure a fungal infection as effectively (and inexpensively) as some of my Amazonian mentors. It shouldn't be the doctor versus the witch doctor. It should be the best aspects of all medical systems (ayurvedic, herbalism, homeopathic, and so on) combined in a way which makes health care more effective and more affordable for all. ➢



The Shaman's Apprentice

Ethnobotanist Mark J. Plotkin and Lynne Cherry, best-selling author of *The Great Kapok Tree*, have created *The Shaman's Apprentice*, a moving, lushly illustrated story with a compelling message about the importance of protecting the healing plants of the earth.

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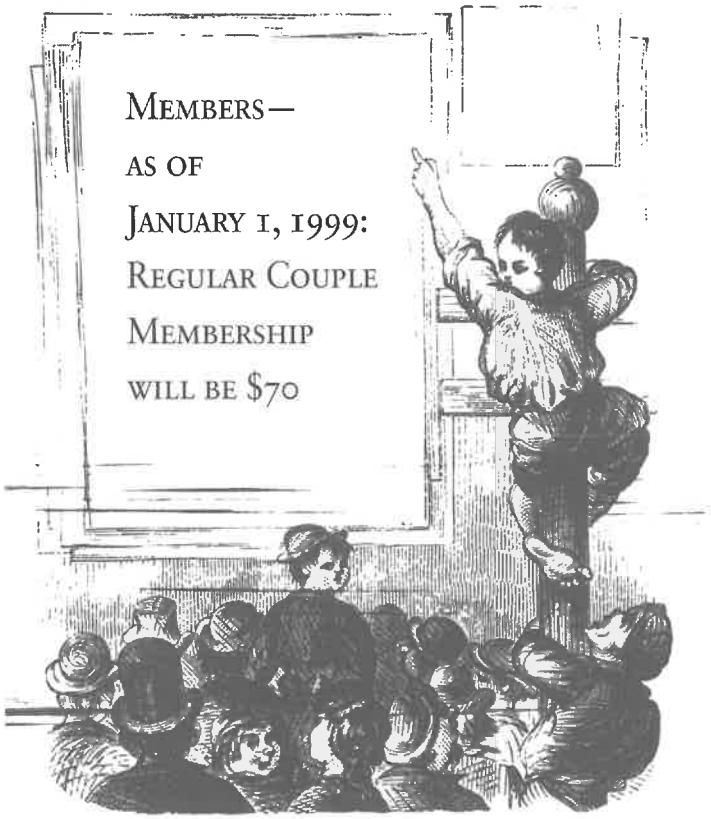

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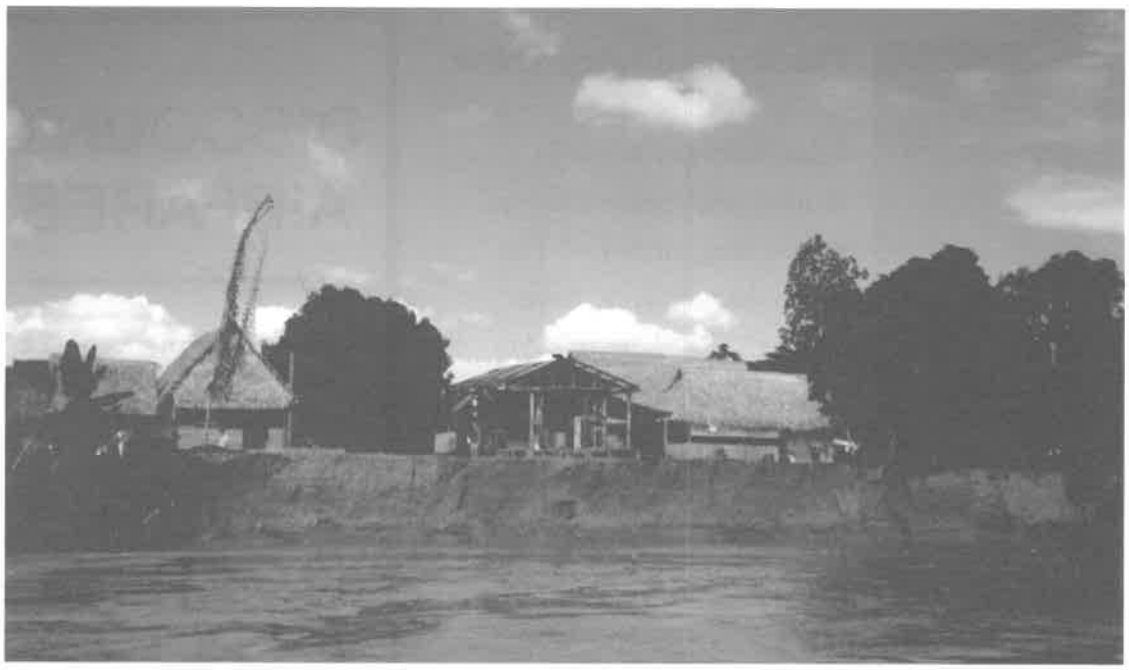


Living on the Edge:

Losing Your House in Boca Manu

by Huw Cordey

everyone gets a chance to occupy the choice water front property

Next month, Walter Mancilla's house will have an uninterrupted view of the river. At the moment, it is partially obscured by his neighbor's house, but this will soon be gone, as will the land it sat on. In Boca Manu, a small village in the heart of the Peruvian Amazon, the houses have all the permanence of a Bolivian government.

Boca Manu sits at the meeting point of two large rivers, the Manu and the Madre de Dios ("Boca" literally means "mouth"), and therein lies the problem. Every year the combined force of these two rivers eats away the banks of Boca Manu—eroding up to 10 meters of land a year. In fact, when Walter first arrived in the village in 1983, the edge of the community lay at a point now somewhere in the middle of the river, and when he built his first house there were at least half a dozen other houses between him and the fast-moving water. Now there's only one.

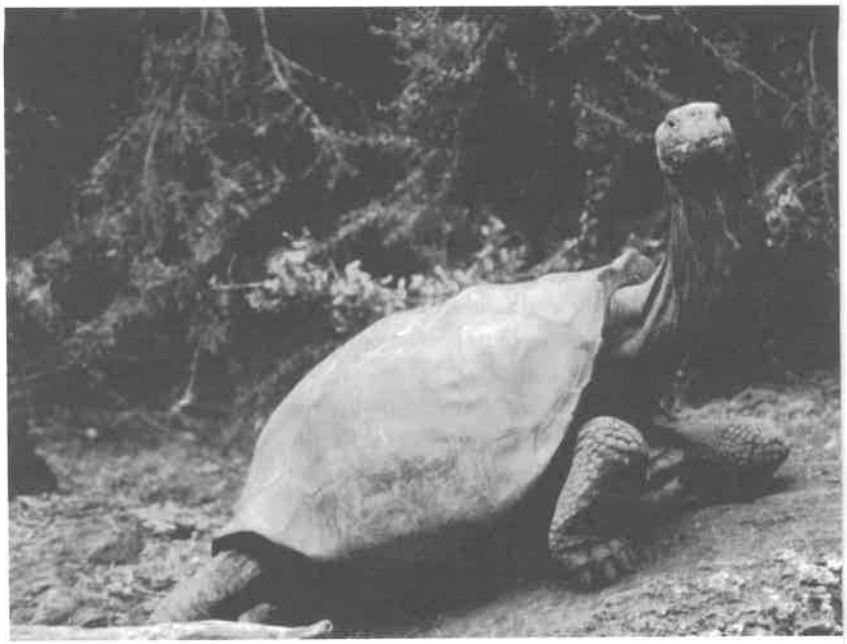
All the houses in Boca Manu are built of wood, not just because they have part of the largest rainforest in the world on their doorsteps but because they can be taken down more easily. When a man's house is about to topple into the river, he dismantles and rebuilds it at the back of the line—and here it will remain until one day, a step out the front door will mean a swim in the river. It wasn't until Walter had explained these facts to me that I understood why he'd made a reference to the small, partially concrete school at the rear of the village. He clearly didn't think the concrete had been a smart move, as sometime in the next decade the concrete part of that school is go-

Continued on page 29

Huw Cordey is currently producing two films on the Amazon for a BBC series on South America slated for the autumn of 2000. His past BBC programs include "Badlands" (a close look at South Dakota's prairie dogs), "Canyons, Dams and Dinosaurs" (on the wildlife of the Grand Canyon), and "Land of the Tiger" (a six-part series on the Indian subcontinent).

In Search of Darwin's Islands

by Richard Halliburton



Lonesome George, the last surviving tortoise of the Isla Pinta subspecies. (Richard Halliburton)

Every evolutionary biologist must make the pilgrimage to the Galápagos Islands, but I resisted for many years. I feared the possibility of letdown: What if reality did not live up to the myth of this showcase of evolution? Also, I don't like traveling with groups, and that is the only practical way to visit the islands.

But when offered a chance to attend a series of seminars and field trips (code words for an academic junket) with a group of card-carrying evolutionary biologists, I couldn't refuse. So I found myself standing in line at the customs station on San Cristóbal, waiting to be searched (for seeds and insects, not weapons).

Blue-footed Boobies performing a mating dance. (Richard Halliburton)

Charles Darwin spent about five weeks in the Galápagos in 1835. He had been traveling for nearly four years. Lonely and homesick, his first impression of the islands was unfavorable: "Nothing could be less inviting than the first appearance."*

The popular view is that Darwin came to his theory of evolution in a single blinding revelation while in the Galápagos. Alan Moorehead, for example, in his well-known *Darwin and the Beagle* writes, "For the *Beagle*, this was just another port of call in a very long voyage, but for Darwin it was much more than that, for it was here, in the most unexpected way—just as a man might have a sudden inspiration while he is traveling in a car or a train—that he began to form a coherent view of the evolution of life on this planet."

The truth is much less dramatic. It was many years before Darwin understood the significance of these islands to his theory of evolution. Nevertheless, in 1835, travel-weary, lonely, and probably bored, he went about his work, collecting plants and animals, and recording his observations

Richard Halliburton is professor of biology at Western Connecticut State University. He teaches courses in genetics and evolutionary biology, and does research in evolutionary genetics. He spends his free time traveling and photographing in the wild places of the world.

and thoughts in his journals.

I have come for similar reasons, though I am neither bored nor lonely. I am equipped with binoculars, cameras, notebooks, and field guides, to observe the plants and animals and to record my own observations to share with my students. Unlike Darwin, I will do no collecting. With more than 40,000 tourists visiting the Galápagos each year, regulations are necessarily very restrictive and penalties severe—I wish to return home on schedule and not be locked up and forgotten in an Ecuadorian jail.

After a couple of hours, we escape from the airport and make our way to the *Estrella del Mar*, our home for the next eight days. The travel brochure describes it as a "superior class" sixteen passenger yacht "perfectly suited for the islands of the Galápagos." I take one look at my smelly, moldy closet of a cabin, and vow to do nothing but sleep in it.

My companions are members of the Society for the Study of Evolution, a scientific society of professional biologists (and others) interested in evolution. The group includes botanists, entomologists, ornithologists, geneticists, and assorted other "-ists." Most are university professors. We come from the U.S.A., Canada, Spain, France, Switzerland, and other countries, and we range in age from 17 to 78. We have in common an intense interest in evolutionary biology and a reverence for the Galápagos as a sacred spot in the history of biology. Only such a group would praise the beauty of flies over lunch.

Darwin recognized that many of the plants and animals in the Galápagos are endemic to the islands. I especially wanted to see some of the unique land birds for which the Galápagos are famous. After lunch, the first bird I see while walking along the rocky shore at Sea Lion Beach is a Yellow Warbler, a common summer resident of New England forests. I had seen it many times on campus and in my own back yard. But *what* a Yellow Warbler this is! A male, bright yellow with a reddish brown cap, dipped its head into a tide pool against a background of nearly black volcanic rocks. I immediately shoot half a roll of film. I begin to realize that, no matter how much film I brought, it is not going to be enough.

Darwin would be embarrassed.

Most famous of all Galápagos birds are, of course, the finches. David Lack first called them Darwin's Finches in 1944, and the name has stuck. Darwin would be embarrassed. He collected thirteen species of finches, and describes them in the first edition of *The Voyage of the Beagle*: "These birds are the most singular of any in the archipelago. They all agree in many points; namely in a peculiar structure of their bill, short tails, general form, and in their plumage...It is very remarkable that a nearly perfect gradation of structure in this one group can be traced in the form of the beak, from one exceeding in dimensions that of the largest gros-beak, to another differing but little from that of a warbler."

Darwin recognized that the finches were unique and that they represented a group of related species. At the time he collected them, however, he did not realize the extent of inter-island variation: "It never occurred to me that the productions of islands only a few miles apart, and placed under the same physical conditions, would be dissimilar." Consequently, he lumped all his specimens together without recording the island from which each individual came. This carelessness has frustrated biologists for over 150 years. While Darwin hinted at the existence of inter-island variation among the finches, he concluded, "But there is not space in this work, to enter on this curious subject." Apparently, in 1839 he thought this variation of little importance.

In the second edition (1845), Darwin inserted the famous sentence, "Seeing this gradation and diversity of structure in one small, intimately related group of birds, one might really fancy that from an original paucity of birds in this archipelago, one species had been taken and modified for different ends." Here, he hints at the real importance of the finches, but does not expand on it. Curiously, he does not even mention the finches in the first edition of *The Origin of Species* (1859). One is left to wonder what Darwin really thought of Darwin's finches.

only God and Peter Grant can tell the finches apart.

Modern biologists have no doubts about their importance. Many scientists since Darwin have studied the finches and added details to our knowledge, making them one of the most studied groups on the planet. Peter and Rosemary Grant, of Princeton University, have devoted much of their scientific lives to studying Darwin's finches, and have built their careers documenting finch evolution in detail unheard of for most other species. As the classic textbook example of adaptive radiation, Darwin's finches make an appearance in virtually all first-year biology courses.

One goal of this trip is to bring back some good finch photographs to show to my students. I should have known better. Like finches everywhere, they are constantly moving, hiding in thick shrubs, always hopping just out of telephoto range. Moreover, most these finches look alike. A common saying among finch workers is that only God and Peter Grant can tell the finches apart. Over several days I spend many hours stalking finches and shoot several rolls of film. I snap only mediocre photographs of several species (which I hope I correctly identified).

I have better luck with the mockingbirds. There are four species of Galápagos mockingbirds and never more than a single species on any given island. Darwin recognized this odd distribution, even though he collected only three species. (He never got to Española, home of the fourth species.) In the first edition of *Voyage of the Beagle*, he writes: "I examined many specimens in the different islands, and in each the respective kind was *alone* present," (Darwin's emphasis). In the first edition of *The Origin of Species*, Darwin cites the mockingbirds, and not the finches, in his discussion of differentiation on islands.

Galápagos mockingbirds are very tame and bold, especially if they are thirsty. On Española I hold out a water bottle. A mockingbird flies over, perches on the rim, and sticks its head into the bottle. I pour some water into my palm, and another lands on my hand to drink. Darwin recounted a similar experience: "One day a mocking-bird alighted on the edge of a pitcher (made of the shell of a tortoise), which I held in my hand whilst lying down. It began very quietly to sip the water, and allowed me to lift it and the vessel from the ground."

The Galápagos are true desert islands. Fifty meters or so from the shore, you find yourself amidst vegetation much like that of other dry regions around the world. Darwin noted that Galápagos vegetation resembled that of the western coast of South America. I'll trust him on that, never having seen the desert coasts myself. I can confirm that the plants I see look much like those found in deserts of the southwestern United States, Mexico, or even Australia. Small in size, with dry leathery leaves, thorns, deep roots, dull, grayish-green colors, regular spacing: These are all are adaptations to a limited water supply and are characteristic of desert plants throughout the world. Some of the genera are the same as I've encountered in the Sonoran Desert: Prickly Pear, the Palo Verde tree. Others are familiar in form, but new in detail: the Palo Santo tree, Saltbush, *Tiquilia*. I am always amazed at the similarity of desert vegetation the world over. But I know this is exactly what I should expect if Darwin's theory is true.

A broken field of black basaltic lava is everywhere covered by a stunted brushwood

I hike up the hot, dry, volcanic slopes of Bartolomé. All I see is *Tiquilia*, small grayish shrubs with tiny leaves, individual plants widely spaced so that all partake of the almost nonexistent water in the soil. These are among the first plants to colonize dry rocky slopes. Darwin again: "A broken field of black basaltic lava is everywhere covered by a stunted brushwood, which shows little signs of life. The dry and parched surface, having been heated by the noonday sun, gave the air a close and sultry feeling, like that from a stove: we fancied even the bushes smelt unpleasantly."

Apparently, some of my companions have not read Darwin, or even the guidebooks for that matter. Hiking up the dry slopes in the heat of day, I overhear someone say, "It never dawned on me to bring a water bottle." I mutter to myself that commercial tour operators are interfering with natural selection.

The only other plant common to these volcanic slopes is the lava cactus (*Brachycereus nesioticus*), a genus endemic to the islands. It is a small, yellow-orangish cactus that grows close to the ground. Like *Tiquilia*, it is among the first plants to gain a foothold on volcanic slopes.

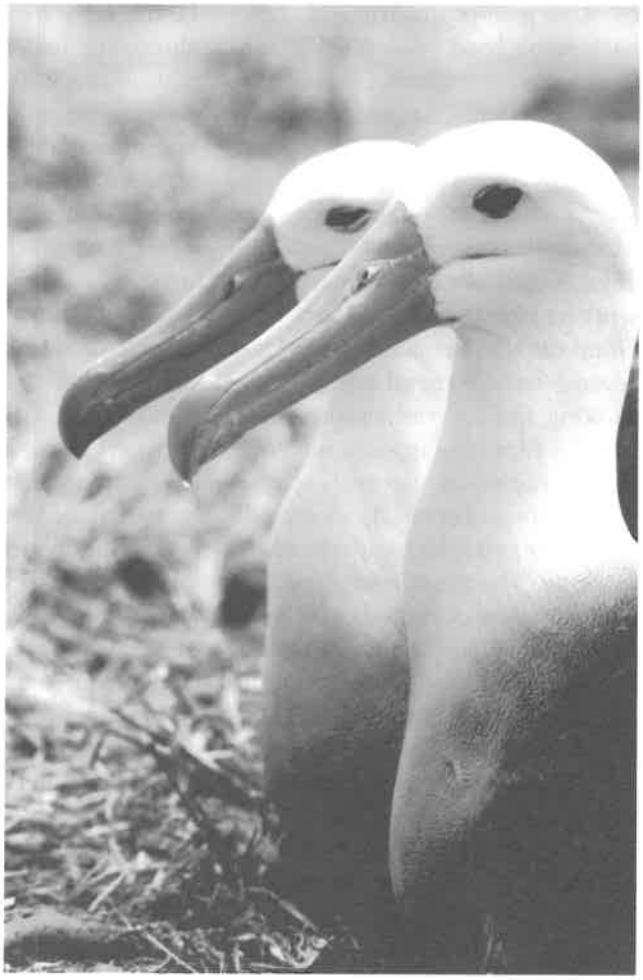
One night, over a beer, we decide to find out.

Two other genera of cacti are found in the Galápagos. I am most interested in *Opuntia* (prickly pear cacti), a group native to the Americas, and introduced into many other parts of the world. Several species of prickly pears are endemic to the Galápagos. Prickly pears are very important to evolutionary biologists because of several species of fruit flies that breed in rotting prickly pear pads. The ecology and development of these flies have been studied in great detail, and they comprise the most thoroughly understood community in evolutionary ecology. I spent a year in Australia studying the population genetics of one of these fruit fly species introduced from South America. To my knowledge, only four or five scientists in the world study this particular species. In one of those remarkable coincidences too implausible to be invented, two of us are on this trip. We both are

Darwin recognized that many of the birds, like this Masked Booby, are endemic to the islands. (Tom Cockrem)

The nest of a Blue-Footed booby, scratched out of a broken field of basaltic lava. (Richard Halliburton)

Marine iguanas spend much of their time submerged in the ocean, searching for food. (Tom Cockrem)



Albatrosses are often sighted by the more than 40,000 tourists who visit theGalápagos each year. (Tom Cockrem)

Given the hordes of tourists and the pressure to accommodate even more, the Galápagos National Park Service does a remarkable job of preserving the environment. (Tom Cockrem)

curious to know if any fruit flies breed in the Galápagos prickly pears. Neither of us is aware of any such studies.

One night, over a beer, we decide to find out. The next day, on South Plaza, we hang back from the group, pretending to photograph a cactus. Once alone, we sneak off the trail, check to make sure no one is watching, then rip apart a rotting prickly pear pad. Inside, we find several kinds insect larvae, including maggots, large and small, but none that look like fruit fly larvae. Just as we decide that the pad is too dry and that our experiment is inconclusive, we are surprised by a guide from another group standing above us. He politely reproves us, firmly insisting that we stay on the trail and with our guide. We apologize sheepishly and hasten to catch up with our group. Privately, I am pleased the guide is enforcing the regulations.

A few days later, we attempt to attract fruit flies with a bucket of rotting, fermenting bananas, a standard technique. We catch nothing.

Darwin also had little luck collecting insects: "I took great pains in collecting the insects, but I was surprised to find, even in the high and damp region, how exceedingly few they were in number. The forests of Tierra del Fuego are certainly much more barren, but with that exception I never collected in so poor a country...although I perseveringly swept under the bushes during all kinds of weather..." The truth is, there are more than 1000 species of insects in the Galápagos; most are small, inconspicuous, and nocturnal, spending the day in dark, hard to reach places. It takes a special effort to collect more than a few species. Darwin didn't look hard enough.

Undoubtedly, the most conspicuous animals of the Galápagos are the marine iguanas. They are so abundant on virtually every rocky coastline that you can hardly take a step without tripping over one. Fortunately, iguanas are vegetarians and harmless—or there would be fewer visitors.

Iguanas feed primarily on algae on the ocean floor. Swimming out to sea, they spend much of their time submerged searching for food. When not underwater, they bask on the rocks, sunning themselves along the shore. I spend some of my time doing the same. The coast is essentially the only place where one may wander freely without a guide. I take advantage of this, and walk off among the rocks to be alone with the iguanas. They pay no attention to me unless I get too close. Then they move off to a nearby rock and resume ignoring me. Whatever I do, the iguanas never enter the water. I think of Darwin's experiments. He noticed that, even when frightened, the iguanas avoided the water: "One day I carried one to a deep pool left by the retiring tide, and threw it in several times as far as I was able. It invariably returned in a direct line to the spot where I stood." Darwin speculated that this strange behavior might arise from fear of possible predators in the water (sharks). "Hence, probably urged by a fixed and hereditary instinct that the shore is its place of safety, whatever the emergency may be, it there takes refuge." No one since has come up with a better explanation.

Since their discovery (in 1535 by a lost sailor), the Galápagos have been exploited. For 300 years or more, pirates hid out on the islands, while whalers and sealers hunted in the surrounding seas. Many ships dropped anchor to take on water and fresh food. The giant tortoises were much favored. Thousands were taken, as their meat was good, and they could be kept alive for months. A local inhabitant informed Darwin that a single ship might take aboard as many as 700 tortoises. Harvesting on this scale reduced the tortoise population dramatically, even in Darwin's time. Since then, the situation has only gotten worse, and several races are gone forever, while others face with extinction.

Scientists have presented George with females from other islands. He is not interested.

We visit the Charles Darwin Research Station. There we meet "Lonesome George," the last surviving tortoise of the Isla Pinta subspecies. Desperate to preserve some remnant of the race, scientists have presented George with females from other islands. He is not interested. George sits there in his pen, back to the world, seemingly resigned to his fate. He shows no interest in the females, his food, or the world around him. He lives out his days, the last of a race stretching back through time.

Flashback to a happier scene: Darwin not only studied the tortoises, but also had a bit of fun with them: "I frequently got on their backs, and then, upon giving a few raps on the hinder part of the shell, they would rise up and walk away; but I found it very difficult to keep my balance." Perhaps Darwin had spent too much time with the gauchos in Argentina.

Islanders told Darwin that the

tortoises were different on each island. "Mr. Lawson [the governor of the colony] maintained that he could at once tell from which island any one was brought." It is hard to know what Darwin thought of this statement. (I have been told by reputable scientists that it is not strictly true.) Darwin mentions tortoise variation without comment in the first edition of the *Voyage* (1839). Only in later editions (1845 and later) does he insert a discussion of inter-island variation, using tortoises as a main example. But they are not mentioned at all to in the first edition in of *The Origin of Species* (1859). Once again, I am left wondering what Darwin really thought of the animals of the Galápagos.

The problem, as usual, is greed

Tourism is both the lifeblood of and a major threat to the Galápagos. Over 40,000 tourists visit annually, spending money on guide services, food, lodging, souvenirs, etc. They also trample the vegetation, erode the slopes, and molest the wildlife. It is the classic "love it to death" problem.

Natural history tourism is potentially an economic boon to third world countries. When properly conducted, it is non-extractive, and most of the money spent by tourists goes into the local economy. This benefits local residents, and assures a continuing source of income by preserving the flora and fauna that tourists come to see. Competent guides and tour leaders also educate visitors about ecological, political, and economic issues, and bolster support for intelligent conservation programs.

The problem, as usual, is greed. Seeing easy money, unscrupulous tour operators bring in oversized, unsupervised groups, ignore environmental safeguards, and fail to enforce rules designed to protect plants and animals. With no concern for long-term effects, they fail to educate the tourists and allow them to erode the landscape, disrupt animal behavior, and collect specimens. The result is a degraded experience for all, and increasing demands for environmentally unsound activities.

Raoul, our guide, tells us that wealthy tourists are now pressuring the Ecuadorian government to allow 5-star hotels, offshore casinos, and luxury cruise ships in the Galápagos. While in the Galápagos, I saw two giant cruise ships, and have since seen ads on the internet for luxury yacht cruises to the islands. Last year, the *Galápagos Explorer,* a giant cruise ship, ran aground near San Cristóbal. Fortunately, the fuel tanks did not rupture. No oil spilled—this time.

There are increasing signs of overcrowding. In just two hours on South Plaza, we ran into several other groups. It was like a crowded day in Yellowstone—or Disneyland. I saw numerous signs of erosion from tourists wandering over the island. The Galápagos National Park Service has recently established clearly marked trails, and the guides appear to be fairly conscientious about keeping people on them. Nevertheless, South Plaza is noticeably scarred.

The Galápagos National Park Service formerly restricted the number of boats operating, and regulated itineraries. Theoretically, this prevented several boats showing up at a given spot at the same time. One wonders how strictly this regulation was enforced. It definitely no longer is—I counted nine tour boats at Bartolomé.

Given the hordes of tourists and the pressure to accommodate even more, the Park Service has done a remarkably good job of preserving the Galápagos environment. Currently, a licensed Ecuadorian guide must accompany all visitors. Guides undergo a rigorous training program and do their best to keep people on the trails and limit their impact. Even bringing food onto the islands is prohibited (a safeguard to keep foreign seeds and insects away), and smoking is not allowed. Guides enforce these regulations and pick up litter. As a result, most areas are remarkably clean.

arson, vandalism, tortoise killings, and threats to tourists

Nevertheless, the most serious threat to the Galápagos, is from those seeking to exploit and extract the islands' resources. Greed and lawlessness have escalated into acts of arson, vandalism, tortoise killings, and threats to tourists. Conservation problems in the Galápagos have reached a crisis.

In January 1995 armed fishermen, protesting the government's closure of the sea cucumber fishery in the Galápagos, seized the Charles Darwin Research Station. They held employees and their families hostage for three days. A similar incident occurred in September 1995, after Ecuador's president vetoed a bill that would have weakened ecological safeguards in the Galápagos. In March 1997, a park warden was seriously wounded in a shootout with sea cucumber fishermen on Isabela.

The Galápagos Marine Resources Reserve was established in 1986, to protect marine life within fifteen miles of the islands. In practice, this protection is nonexistent. Commercial fishermen, from mainland Ecuador and foreign countries, illegally harvest sharks, sea cucum-

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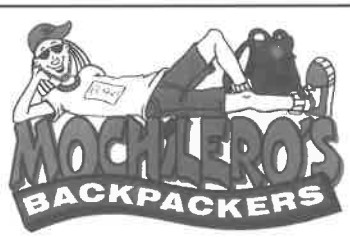

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The Lessons of History

El Niño and The Fall of Empires

by Kenneth R. Wright

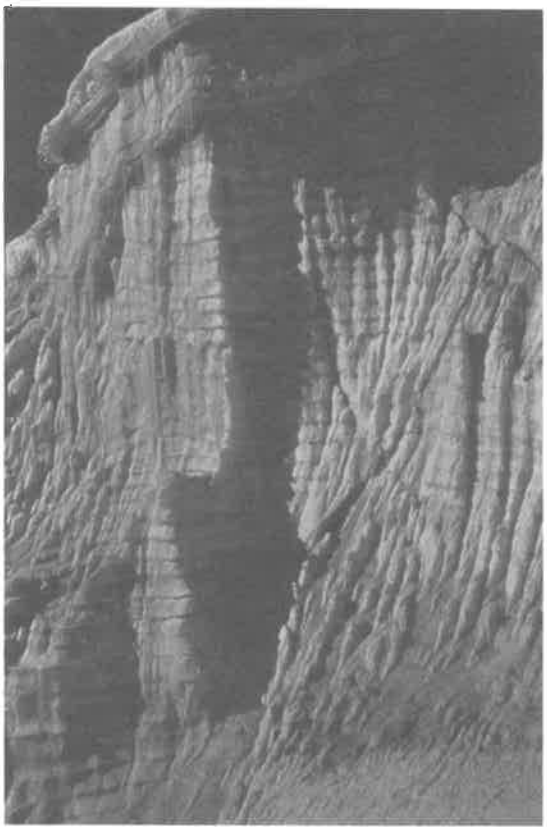

Figure 3 - Ice layers in the Quelccaya Ice Cap, Peru. Each layer represents one year of accumulation. The older layers below are thinner because of the heavy weight from above.

The history of Andean civilization stretches back some 3800 years to the Initial Period. Andean cultures such as the Moche, Nasca, Chavin, Inca, Tiwanaku, and others have been studied extensively, their temples and cities excavated, their works of art collected and the multitude of ruins analyzed and cataloged.

Lacking the scrolls and clay tablets found at digs in the Middle East, for example, Andean scholars have been forced to rely on physical evidence found in and amongst the ruins to understand migration, urban planning, water supply, agriculture, and the rise and fall of empires.

Did drought precipitate the fall of the Tiwanaku empire?

This is no longer the case. During the last several decades, glaciologists, meteorologists, geologists, marine scientists, oceanographers and hydrogeologists have probed the great ice caps and glaciers of the Andes, studied floodplain deposits, and measured ocean temperatures. The role of climate in ancient history is etched in glacial layers, in cores taken from Lake Titicaca, in the rings of ancient trees. What part did floods play in Moche history? Did drought

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precipitate the fall of the Tiwanaku empire? These and other questions can now be answered with greater certainty than ever before. This information makes possible solid correlations with new and credible data linking droughts and floods to specific El Niño occurrences. The results of this continuing research is a climatological record of Andean weather, dating back not just a century or two, but spanning 1500 years as illustrated in Figure 1.

Long before man arrived in the Americas, storms buffeted the Andes, floods inundated coastal plains, prolonged droughts parched the land. All the meteorological phenomenon that we read about in newspapers, see on the weather channel, or put up with today—floods, drought, storms, winds etc.—occurred in the past. Natural weather cycles such as El Niño, all the climate extremes, inevitably repeat themselves over time.

Whole peoples went hungry

What is El Niño? It is a warming of the Pacific coastal surface water off South America. Typically, the onset of El Niño occurs during the Christmas season, hence the name "El Niño," the Spanish word for "Christchild." Warming of surface waters is significant, ranging between 2 to 8°C (4 to 14°F) and may last a full year. The Pacific Ocean thermocline (layer of water between the warm surface and a layer of colder water underneath) deepens, causing a reversal of coastal current flow from north to south. The nutrient supply to the photic zone decreases. Then, too, El Niño disrupts the winds that sweep Northern Peru and bring about the upwelling of deep nutrient-rich waters. When this happens, the usually vast shoals of fish off Peru disappear. In Peru, El Niño can be a time when great rivers roar down from the Andes, gushing onto the coastal plains. At the same time, drought may scorch immense areas in the Southern Andes., El Niño is also associated with an atmospheric counterpart first recognized by G. T. Walker over seventy years ago. This atmospheric condition is known in scientific circles as the Southern Oscillation (SO), hence the term El Niño/Southern Oscillation (ENSO). Simply stated, ENSO represents the single major cause of international climate variation on a world-wide scale.

The Ancient Climate Record

The rise of great Andean empires depended on surplus food production. High agricultural yield meant power—to feed armies, to control far flung peoples often a thousand miles from the throne. Most of all, surplus food freed up enormous energy—human labor to build monumental stone structures, defend the empire, create works of art. On the other hand, mighty empires could be brought to their knees or even toppled by changes in climate. Prolonged droughts or repeated floods crippled food supply. Whole peoples went hungry and lost faith in their rulers.

The Quelccaya ice cap is located in the Cordillera Oriental mountain range of southern Peru approximately 200 km northwest of Lake Titicaca. During the 1980s, scientists drilled and analyzed ice cores from the ice cap. Their work has given us a record of the climate dating from 500 AD to 1984 AD. Like layers in a cake, each slab of the ice record reveals yearly accumulations of ice along with dust particles and oxygen isotopes. A layer's thickness represents yearly precipitation (Figure 3). The oxygen isotope is a guide to temperature. Dust from parched agricultural fields is blown by the wind, some of it settling on the glacier. These dust particle concentrations are used to estimate severity of drought conditions and to identify periods of massive earthmoving. The variations in ice cap layers corresponding to the years 1935-85 correlate well with known twentieth century periods of El Niño (Table 1).

Ice cap data also supports archaeological field work. At a variety of archaeological sites physical evidence of great flooding, drought and destruction has been found, dated, and correlated with ice core data and Professor Kolata's sediment cores from Lake Titicaca. Over time, the particulars of El Niño's impact on ancient civilizations is being unraveled. For example, cores from the Quelccaya ice cap provide "ground truth" or confirmation of suspected floods and droughts, and one particularly dry period viewed as the "granddaddy" drought that occurred during the sixth century (Figure 4). The climate tended to be more moderate during the seventh and early eighth centuries with well-above average accumulations from about 740 to 950 AD. This was followed by some 350 years of progressively drier weather with each passing century (Figure 1).

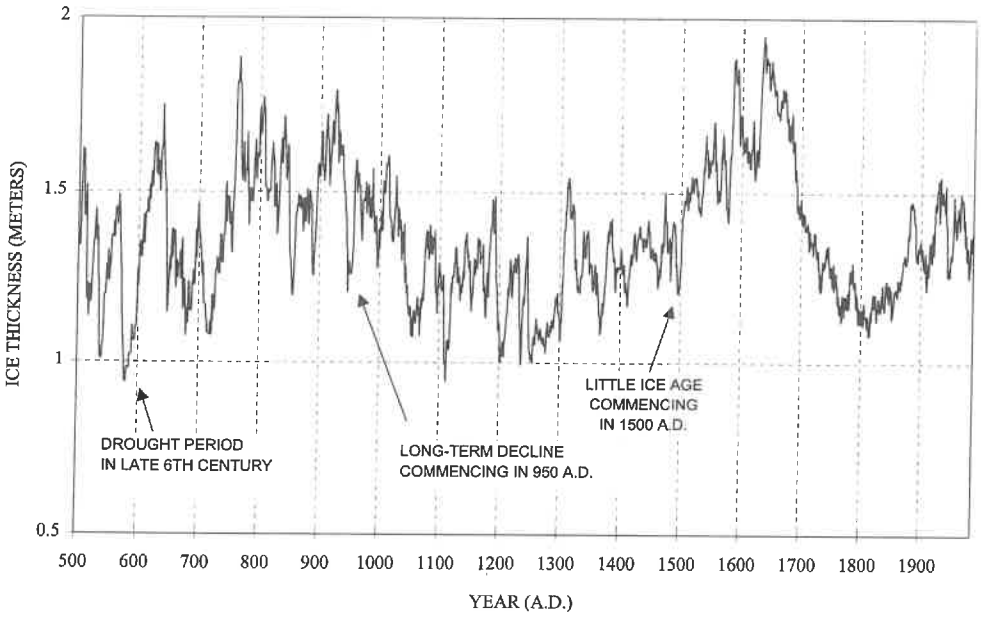
Moche Kingdom

Professor and Moche scholar Michael E. Moseley has written that the Moche empire represents a remarkable achievement in statecraft. For the first time, the coastal populations were forged together in one nation. Under the Moche, the arts flourished. Peace and prosperity reigned. Alas, it did not endure. Shortly before 600 AD the Moche River, repeatedly swollen by heavy rains, swept down from the moun-

tains, thundering toward the metropolis built of adobe. The seething water gouged away whole sections of urban landscape, gutted agricultural fields, and stripped away layers of ground to depths of six feet. And when, at last, after the vast work of reconstruction was finally completed, the skies cleared. Then for weeks and months on end, no rain fell. Drought settled over the land and the winds picked up. The soil washed out to the sea by the great floods returned to the beaches as sand and was then blown inland. Strong winds carried clouds of sand, burying the Moche capitol and surrounding fields under massive dunes. Since 1988, Thor Heyerdahl has been studying the pyramids of Túcume in the Lambayeque Valley of northern Peru about 30 km inland from the Pacific Coast. It was here the Moche flourished in the nearby Moche Valley, its capitol flanked by two large pyramids—Huaca del Sol and Huaca de la Luna—that dominated the sandy plains (Figure 5). Heyerdahl has found archaeological evidence of catastrophes between 500 and 600 AD. He also uncovered signs of a prolonged and severe drought during the sixth century AD interrupted by periods of rain brought on by El Niño.

Ice core data confirm the archaeological field work—El Niño struck the Moche capitol in 511-12, 546, 576, and again in 600 AD. Core samples also point to a great drought that began in 563 AD and continued until 594 AD (see Figure 4). During this period, rainfall dropped 30 percent below normal.

Figure 1. Quelccaya Ice Cap record illustrated as 10-year moving average for 500 - 1984 A.D. period.



undone by the floods that followed

To their credit, the Moche survived years of drought, only to be undone by the floods that followed. After the floods circa 600 AD, their fields stripped of topsoil and covered with dunes of sand, the Moche abandoned their capitol, and moved their city north to Pampa Grande in the Lambayeque Valley, alas another floodplain. Here, they carried on in their new city until 700 AD when the archaeological evidence shows fire leveled the capitol. It is not known if the Moche, unable to cope with recurrent floods, abandoned Pampa Grande or if the empire fell apart from a myriad of causes.

Nearby, in northern Peru, the Sican culture rose up after the Moche collapse. Occupying an immense area in the present-day Lambayeque province with more than a dozen pyramids, the Sican people built their capitol, Batan Grande, in the Leche Valley. They too experienced the effects of El Niño when floods devastated Batan Grande around 1100 AD. The catastrophe doomed Batan Grande forever.

Tiwanaku Empire

Around 400 AD, concurrently with the Moche IV Kingdom, the Tiwanaku Empire near Lake Titicaca had learned to live with the thin air and temperature extremes at 12,000 feet.

From its capitol near the south shore of the lake, Tiwanaku expanded rapidly. In just two centuries it had become an economic and political power spreading across what is now southern Peru, northern Chile, and Bolivia. Like other empires Tiwanaku expansion depended on abundant food production, and for over seven centuries, it regularly produced food surpluses.

Drought seared the south-central Andes for 300 years.

The German adventurer Arthur Posnansky explored Tiwanaku in 1904 and, in his 1945 monumental

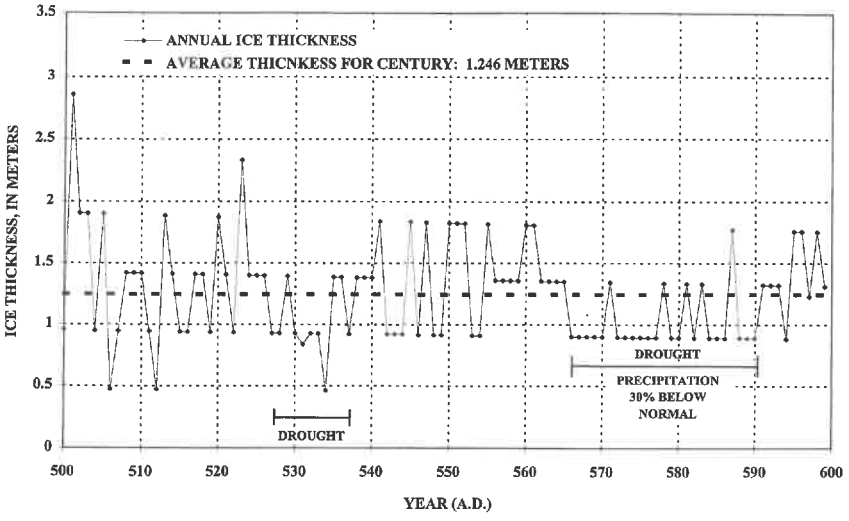
Table 1 - 20th Century Occurrences of El Niño and La Niña

	Occurrences				
	El Niño	La Niña		El Niño	La Niña
1901	●		1951		
1902			1952	●	
1903	●		1953		
1904		●	1954	●	
1905			1955		●
1906	●		1956		
1907		●	1957		
1908			1958	●	
1909		●	1959		
1910			1960		
1911			1961		
1912	●		1962		
1913			1963		
1914			1964	●	
1915	●		1965		●
1916			1966	●	
1917		●	1967		
1918			1968		
1919	●		1969		
1920			1970	●	
1921		●	1971		●
1922			1972		
1923			1973	●	
1924	●		1974		●
1925		●	1975		
1926	●		1976		●
1927			1977	●	
1928			1978	●	
1929		●	1979		
1930			1980		
1931	●		1981		
1932		●	1982		
1933	●		1983	●	
1934			1984		
1935			1985		
1936			1986		
1937			1987		
1938			1988		
1939		●	1989	●	●
1940	●		1990		
1941	●		1991		
1942	●		1992		
1943		●	1993		
1944			1994		
1945			1995		
1946			1996		
1947	●		1997	●	
1948			1998		
1949			1999		
1950		●	2000		

Based on Cayan and Webb 1992, p. 32.

two-volume book on the Tiwanaku, attributed its decline to "malign climate conditions." Indeed, the historical record confirms that the Andean climate can be malign. A 32-year-long drought from 563 to 594 AD caused widespread devastation across the empire. There is evidence, however, that a lesson was learned. The rulers took the catastrophe as a warning. They revolutionized their agriculture, instituting a totally new system which, some believe, allowed the empire to prosper for 400 more years. In any event, Tiwanaku agricultural surpluses after the drought can be attributed to the raised field system. Water surrounded raised agricultural mounds. Warmed during the day, the water kept the crops from freezing during the cold Andean nights and even extended the growing season. Raised field agriculture grew to encompass an immense area, at least 19,000 hectares (47,120 acres). Studies show that land cultivated in this manner could yield 20 metric tons of potatoes per hectare. Construction of the raised field system no doubt required major earth moving operations. Interestingly, high dust concentrations show up in the Quelccaya ice core around 600 AD when the system was being built.

Figure 4. Sixth century Quelccaya Ice Cap record showing two periods of drought.



the royal dynasty of Tiwanaku tottered and fell.

From about 950 AD on, a long-term decline in rainfall set in. After 1000 AD, crops withered in the field; hunger gripped the empire. Drought seared the south-central Andes, lasting for 300 years. The abundant harvests of the past were now only memories. Unable to feed the hungry, the royal dynasty of Tiwanaku tottered and fell.

Huari Empire

While the Moche wrestled with floods and droughts, the Huari empire spread in the southern Andes 25 km north of present-day Ayacucho. The Huari flourished, Michael Mosley thinks, because of agricultural practices they adopted from the Huarpa, an earlier civilization that inhabited the Ayacucho area. The Huarpa are thought to have invented terrace farming. Terraces allowed them to farm the steep mountainsides, using primary and secondary canals for irrigation. Building terraces demanded intensive labor, but once built, terraces provided steady food production.

The Huari added their knowledge of maize varieties with Huarpa technology to produce high grain yields. The Huari surrounded their capital with irrigated terraces, and over time, introduced terraces throughout their empire.

Irrigated terraces allowed the Huari to survive the thirty-year

drought that, in the 6th century, struck the Moche with such devastating impact. Terraced hillsides, moreover, remained unaffected by El Niño. The floods that leveled crops on the Moche floodplain caused little damage to Huari agriculture. For some 400 years, the Huari Empire successfully countered the vagaries of nature.

The Inca state spanned over 2,600 miles from north to south

But Huari ingenuity could not cope with the steady decline in rainfall that started about 950 AD and continued for several centuries. The Huari Empire entered a period of decline much like the Tiwanaku culture. According to Huari scholar Gordan McEwan, the Huari, over time, slowly ceased to function as a society. Archeological evidence reveals doorways carefully blocked up like houses boarded up against a storm and administrative centers such as Pikillacta purposefully closed down. All these measures were done with care, as if the Huari planned to return. The collapse most likely took place in a gradual and orderly way, but in the end, centuries of drought proved too much for the Huari.

Inca Empire

Some three or four centuries later, the Inca people rose to prominence. As it grew, the Inca state successfully absorbed far-flung peoples into an empire which at its height spanned over 2,600 miles from north to south. The Incas' rapid rise hinged on agricultural surpluses which they stored in countless stone food warehouses conspicuously dotting the hillsides in view of the lower-lying communities. The abundant food freed up a portion of the population of ten million for the military as well as for public works such as the construction of canals, roads, buildings, monuments, and temples. This they achieved through their mastery of land and water.

The Incas employed agricultural techniques formerly developed by their predecessors while readily adopting new methods from the peoples they conquered. They quickly learned to build irrigation systems and additional flood resistant terraces on steep mountainsides. They also perfected vertical agricultural zones, planting at different elevations crops that thrive at particular altitudes, thereby maximizing harvests. The length of the Inca Empire straddled several El Niño zones. From this they learned flexibility in dealing with a variety of climatic conditions—i.e. heavy rains in the north while drought parched the southern highlands.

Over time, the Inca Empire, endured wide environmental extremes as described by Huamán Poma in 1613 AD. Poma describes volcanic eruptions, the destruction of Arequipa, earthquakes, frosts, hailstorms, and a ten-year drought. Nevertheless, the Inca empire held together and was able to employ a significant portion of its population for military purposes and public works. The Inca's eagerness to experiment with new technology and improve their knowledge of agriculture is illustrated by their agricultural research stations, such as the one at Tipon. The magnificent canal bringing water to Tipon covers many kilometers. At the time of abandonment, a fine reservoir was under construction which would have increased the water management capability at Tipon. There is evidence the Incas also understood micro-climatology. Tipon is in a narrow valley only 23 kilometers downstream from Cusco. The Incas built magnificent terraces here. Stone terraces and walls together with rock outcrops jutting from the sides of the valley, capture the sun's heat during the day and radiate warmth during the cold nights. Also, in this narrow valley at Tipon, warm air currents from the main valley below flow up and across the agricultural terraces extending the growing season beyond that of valleys not so fortuitously situated.

If further proof of Incan agricultural prowess were needed, it can be found in the fact that the Inca empire housed and fed an estimated ten million people, with energy and manpower left over to construct the "crown jewels" such as Ollantaytambo and Machu Picchu, both

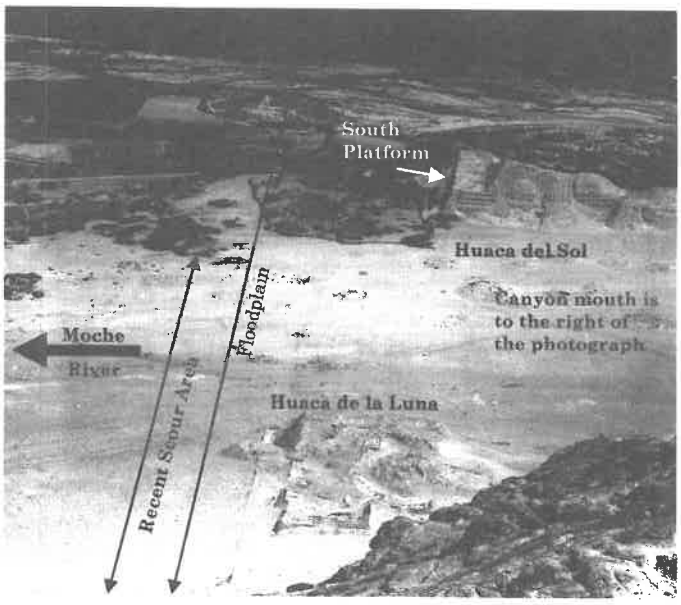


Figure 5 - View looking West across the Moche River and the site of the early seat of power of the Moche Kingdom. An El Niño flood in the 6th century decimated the capital city and stripped away buildings and agricultural fields. (Photo courtesy of the American Museum of Natural History, overlay by Wright Water Engineers)

elaborate feats of engineering. The Inca State fed numbers considerably greater than the Indian population that inhabits this region today—impoverished descendants eking out a subsistence living farming their small plots of land.

The Inca Empire, weakened by smallpox and civil war, eventually succumbed to the treachery of Conquistador Francisco Pizarro. During its brief 200 year history, however, it successfully overcame the challenges of drought and flood, efficiently making use of the land and achieving high levels of food production.

Lessons to Be Learned

The demands of an exploding world population have created a reliance on irrigation, centralized food distribution, and ever-higher crop yields. So far, the green revolution is keeping pace, producing crop yields many times those of only seventy-five years ago. There are dangers, however, notably the mono-culture crop system. Increased agricultural demands have moreover led to expansion—both urban and agricultural—into flood-prone areas. As farmers, corporate agriculture, and governments struggle to increase agricultural production, they tend more than ever before to make plans based on average climate conditions—average rainfall, average sunshine, average temperatures.

Then, too, engineers and scientists ignore climate extremes. Agricultural decisions are made on a statistical "frequency of occurrence" or tied to an economic payout when such decisions should reflect environmental design principles that take into account ecology, climate, and harmony with nature.

The Andean countries are unique. No other part of the western hemisphere has been studied by archaeologists so extensively. This research has provided untold opportunities to learn from the past. The rich and abundant research by archaeologists and physical scientists has extended our knowledge of ancient Andean civilizations—the climate that prevailed, the weather extremes these cultures endured, and the unique farming practices they developed and used with great success.

Alas, the countries of western South America—Ecuador, Peru, Bolivia, and Chile—have not yet learned the lessons of history, the lessons clearly inscribed amongst the many ruins and indelibly etched in the ice caps of the Andes.

3,500 people died in seven minutes

Extreme weather conditions—floods, droughts, etc.—are regular disasters in Andean countries. The deadly damage they can cause, however, is greatly exacerbated by unwise land use. In 1962, for example, 3,500 people died in seven minutes as ice and debris flow crashed down a mountain with explosive force at 80 miles per hour. Ranrahirco and nearby communities at the foot of Nevada Huascarán perished. Eight years later, a similar, lethal flood of water, rocks and mud rumbled down the same valley burying Yangay which had escaped the 1962 disaster due to a ridge formerly serving as a barrier. In 1997, heavy rains loosened the soil on steep terrain. Mudslides buried communities near Arequipa, Peru. Families of the many victims spent days fruitlessly digging through the mud and debris for their loved ones. Sadly, these are just a few random examples that illustrate the widespread disregard of climate extremes when building towns and villages.

Mudslides buried communities near Arequipa

Nor is South America alone in ignoring the lessons of history. In the United States, floodplain management at the local community level has been shifted to the Federal Emergency Management Agency (FEMA). FEMA uses the National Flood Insurance Program to limit unwise floodplain development. This did not happen overnight. It took some thirty years from the time Gilbert White wrote his important study on flood-

plain management before Congress finally passed the Flood Insurance Act (1968). Some communities, even now, have not adopted floodplain regulations and are not in the FEMA program.

The ancient Andeans lacked long-term climate records. Today, on the other hand, research of ancient Andean climate patterns and El Niño events are instantly available on the Internet. Floodplain management methods and technology are well known and widely available. No longer are modern societies at the mercy of nature. El Niño-induced weather can be tracked via satellite. With present technology, scientists have advance warning of droughts and floods. In short, modern engineers with all the advantages of hindsight have what they need to make plans for orderly urban growth and environmentally sound land use.

To paraphrase George Santayana, if we don't learn from our past, we will be forced to relive it.

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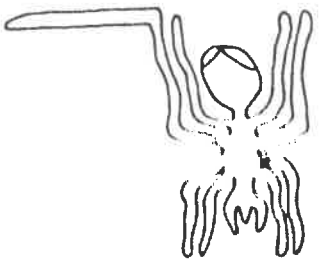

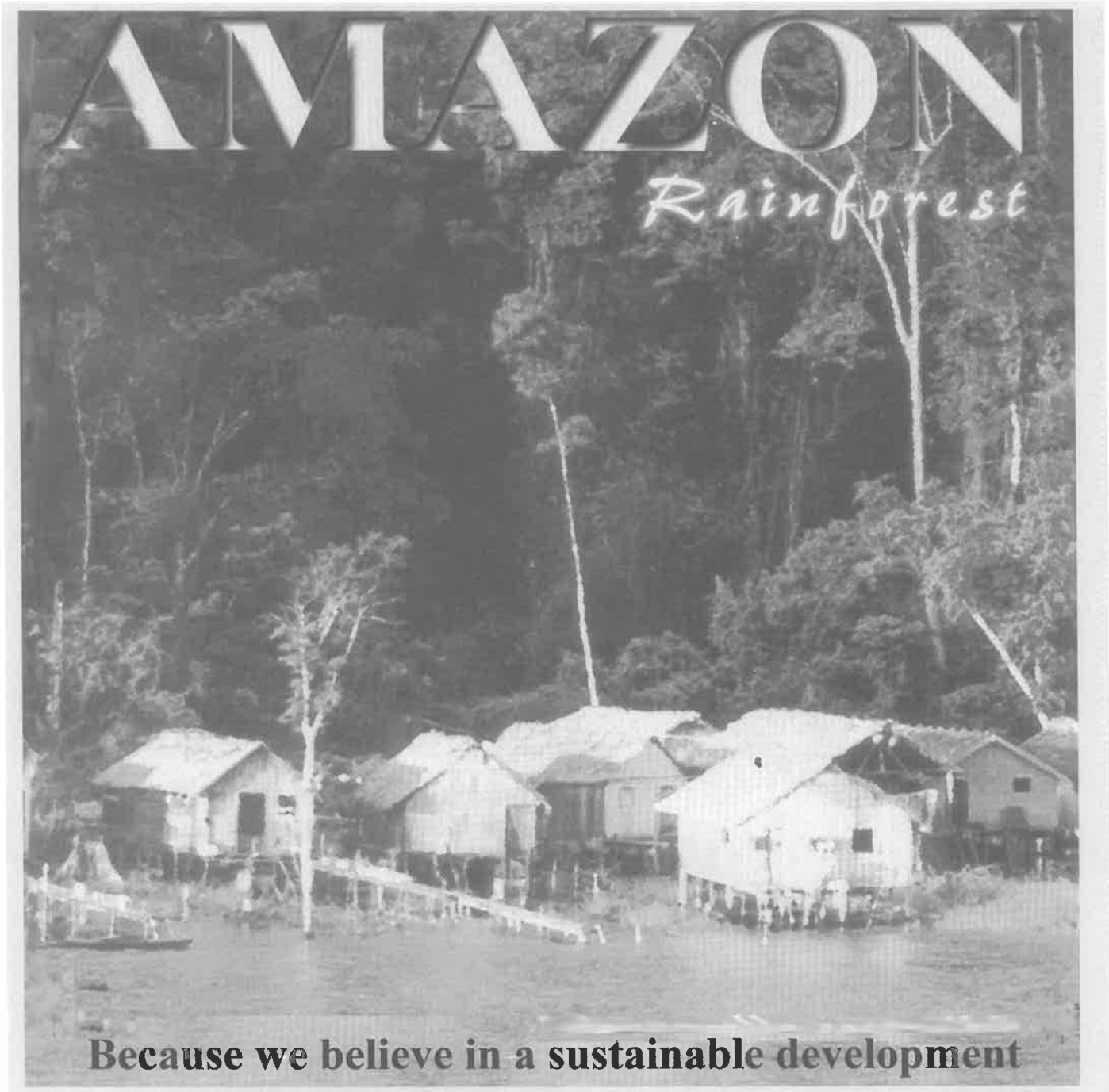

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Continued from page 12.

ing to make a big splash in the Manu river—to the jubilation of the school children, no doubt.

you may find your front yard disappearing

Boca Manu must be a confusing place for postmen (if, indeed, there are any), but the residents know exactly where they stand—provided it's not too near the river's edge. In fact, most find the situation agreeable. It's an advantage to have one's house near the waterfront, and because of the "musical houses," everyone gets a chance to occupy the choice water front property—pole position—for around two years, though of course this depends entirely on the severity of the weather. A long rainy season will speed up the erosion. This happens every eight to ten years. If your house happens to be fronting the river at this time, you may find your front yard disappearing more quickly than you hoped.

Boca Manu is at the gateway to Manu National Park, a vast tract of unspoiled rainforest. Doubling as shops, houses on the waterfront profit by trading with passing tourists and locals. They can sell you that last packet of biscuits or the roll of soft toilet paper you forgot to pack. It's also one of the few places in the jungle where you can find a beer, and if you're lucky, it will be colder than the ambient temperature.

If you don't want to be a shopkeeper in Boca Manu, you can sell your valued real estate to someone who does. A prime site can fetch $3,000 dollars, a tidy sum in Boca Manu. Or, if you don't like waiting years for a house with waterfrontage, you can do what Walter has done—build another house towards the back. (Strangely, Walter seems to be the only person in the village to have cottoned to this.) He may not be able to still the waters, but he knows a good business opportunity when he sees one.

Even taking into account all these benefits, you may still wonder why the residents of Boca Manu don't move their village to a less-exposed site. After all, collapsing banks can be dangerous. Just before my visit, a five year old boy standing too close to the edge (and the eight foot drop) nearly drowned when the bank suddenly gave way. Barely able to swim, he was lucky when the cries of his two year old sister summoned help.

Collapsing banks can be dangerous.

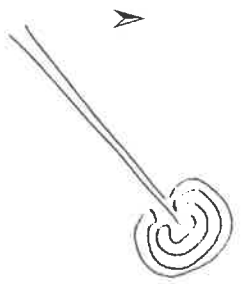
However, there's another reason why Boca Manu is where it is. Lumber and boat building are big business in Boca Manu. Both rely on a steady stream of trees coming out of Manu National Park. Most prized are the cedar trees. Equipped with chainsaws, the villagers could cut down thousands in no time at all, but logging in the Park is illegal, a prohibition vigorously enforced by the Park guards. So, the villagers wait for the trees to come to them.

Cedar trees have a lot in common with the houses of Boca Manu. As the meandering current cuts away the banks, the trees topple into the water and float downstream. This happens quite often. As a result, Boca Manu, being the closest village to the Park, gets first crack at the steady stream of timber. The next village downstream gets only those logs that float past Boca Manu in the early hours of the morning when Boca Manu sleeps.

Walter was my guide during my trip up the Manu river to the Park. Walter knows the wildlife and can recognize almost every bird by its call alone. He can spot a brown stick insect sleeping on a brown stick at twenty paces. He also has a good eye for a floating cedar tree. While on the river, we saw a number of large specimens, temporarily stranded on sand banks. Walter and the boatman sized them up appreciatively with glances one might bestow on a pretty woman in a short skirt. This was just window shopping, of course—there was nothing they could do until the logs drifted downriver out of the Park and past Boca Manu.

The men of Boca Manu haul in a floating log with the flourish of rodeo cowboys jumping off their horses to wrestle a steer to the ground. Spotting a trunk, they race across the river in their boats, jump onto the log with a rope, and lash it tightly to the boat. This sport brings in about 90,000 cubic feet of wood a year. It is quite possibly the most environmentally friendly timber business in the Amazon, a source of pride for Walter, a passionate conservationist.

As I left Boca Manu, the river gurgled around the posts holding up the house in front of Walter's. His neighbor was busy dismantling his home. Soon, Walter and his family will sit at home and look across the Manu River, their view unimpeded. But then it will be their turn to watch the river eating away the ground, inching ever closer to their front door.



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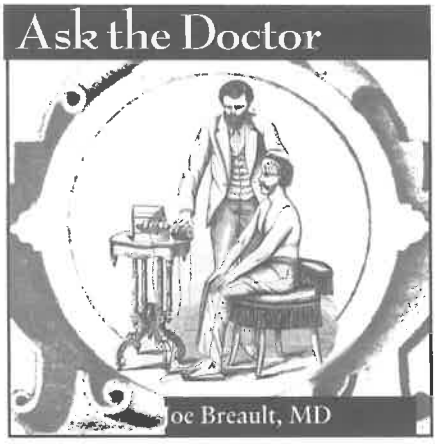

Dr. Joseph Breault graduated from Tulane University School of Medicine with combined MD and MPHTM (Tropical Medicine) degrees. Currently the staff physician at the Ochsner Clinic in New Orleans, he has previously worked at the PHS Indian Hospitals in South Dakota and overseas in the Dominican Republic and Bolivia.

Altitude Sickness

Q: My husband and I will be traveling for 18 days in Ecuador. We are both seniors (over 62) and in generally good health. Do you know of any altitude medication or have suggestions for problems with altitude?

A: Altitude sickness is due to a reduction in oxygen. Symptoms include rapid breathing and heart beat, headache, dehydration, loss of appetite, vomiting, stumbling, and unusual fatigue when walking.

Tips to avoid altitude sickness:

- Avoid rapid ascents to high altitudes by airplane. Give yourself time to acclimate at gradually increasing altitudes. Spend about two days getting to 10,000 ft (3050 m) and avoid overexertion during these initial days.
- Don't take narcotics or sedatives above 8000 ft (2450 m). Drink lots of fluids and eat a low salt diet.
- Wear appropriately warm clothing to avoid hypothermia.
- If you have symptoms of altitude illness, descend.

Taking acetazolamide (Diamox) 125 mg twice a day can speed acclimatization for those going to 10,000 ft (3050 m) rapidly and for those with past altitude problems. Start taking it a day before ascending and continue taking it for 3 to 5 days. If you choose not to use acetazolamide for prevention, carry some with you to use if you do devolp altitude illness. Don't take it if you are allergic to sulfa drugs. Ask your doctor for a prescription, and consider trying it out at home first to make sure you don't have a negative reaction to it.

Q: Will I get side effects from altitude pills?

A: When you take acetazolamide, you may urinate more frequently and have sensations of numbness. Nausea and impotence are less common. It can also affect the taste of carbonated beverages.

Q: Can altitude illness be dangerous?

A: Progressively more serious forms of altitude sickness include:

- *Acute mountain sickness*. This can occur at 6500 ft (2000 m). About a quarter of Colorado resort skiers get acute mountain sickness.
- *High altitude pulmonary edema (HAPE)*. With this stage of altitude sickness, water builds up in the lungs. One to two percent of travelers to 12,000 ft (3650 m) develop HAPE; the mortality rate is high.
- *High altitude cerebral edema,* or swelling of the brain. This is rare below 10,000 ft (3050 m) but can be fatal in 24 hours.

At high altitude, if you or your companion suddenly develops mental confusion, acts irrationally, has trouble with balance, or has significant difficulty breathing, descend immediately.

Q: I have a friend that is 2 months pregnant who wants to visit Cusco and La Paz, 3300 m and 3600 m elevation respectively. Will a 5 day trip to this altitude damage the fetus?

A: There haven't been any studies on pregnant women traveling to higher altitudes. However, it is known that pregnant women who reside at high altitudes have more problems with irregular blood pressure and have fetuses that haven't grown as well as expected. Some experts recommend limiting 1st trimester travel to 8000 ft (2450m), which means your friend should avoid Cusco and La Paz.

Q: Any problems with taking birth control pills at higher altitudes?

A: Yes. At *any* altitude, the estrogen in birth control pills slightly increases the risk of blood clots. Theoretically, if you take the pill at high altitudes, there's an increased risk of blood clots, including fatal clots that enter your lungs. Some experts suggest that you should use alternative forms of birth control above 10,000 ft (3050 m). Please discuss these issues with your doctor before you leave.

Q: Is altitude dangerous for my kids?

A: Young children may be more susceptible to altitude illness. To be on the safe side, descend if your children show even vague symptoms of altitude sickness. Nevertheless, young children have been taken to over 15,000 ft (4570 m) without problems. Drugs for altitude illness prevention or treatment haven't been tested for kids, so they're generally not used.

Q: Where can I get more information?

A: An internet site with good information is www.princeton.edu/~oa/altitude.html. Additionally, *The Travel & Tropical Medicine Manual* by Drs. Elaine C. Jong & Russell McMullen has a chapter on altitude illness. Always consult your doctor to apply information to your individual case and to get the necessary prescriptions.

You can e-mail medical questions to Dr. Breault at **joebreault@worldnet.att.net** Although the questions cannot be answered personally, a selection of questions will be answered and published in future issues of the South American Explorer.

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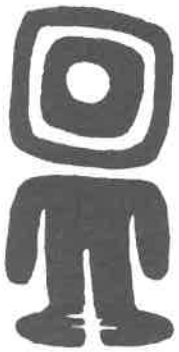

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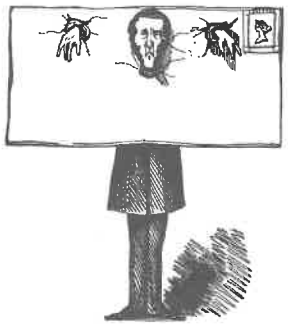

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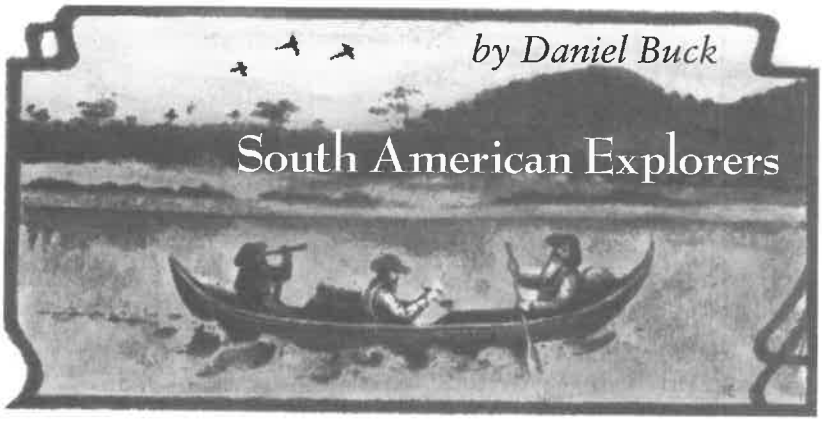

by Daniel Buck

South American Explorers

Annie Smith Peck

Annie Smith Peck's lifetime of adventure so impressed Amelia Earhart that she confessed to feeling "like an upstart" by comparison.

hooked on mountain climbing.

A Rhode Island native, Peck majored in Greek at the University of Michigan and went on to become one of the first female college professors in the United States. Her travels in Europe during the 1880s led to a career lecturing on Greek and Roman archaeology. She also got hooked on mountain climbing.

her goal was to conquer a peak no man had climbed

In 1896, at the age of forty-five, she became the third woman to summit the Matterhorn—and the first to do so in pants (In that era, a woman's wearing pants in public was a serious breach of the peace). Peck, also an ardent suffragette, became an instant celebrity. Her lecture business flourished, and the Singer Company included her photograph, in full climbing regalia, knickers and all, with each new sewing machine.

Not satisfied with her Alpine triumphs, Peck went climbing in Mexico, bagging Orizaba and Popocatepetl. But her goal was to conquer a peak no man had climbed, an aspiration that led her to the Bolivian Cordillera Real and Mt. Sorata (now Illampu), a mountain thought at the time to be the highest in South America.

Unlike many climbers of the era, Peck was not independently wealthy. She had to finance her expedition by selling subscriptions and endorsements. Finally, in 1903, she steamed for South America with two Swiss guides and a professor she had only briefly met.

Once in Bolivia, Peck's luck soured. Early on the mountain, the professor burrowed into his sleeping bag, refusing to emerge. His boycott inspired the porters, who went on strike. Severely disappointed, she packed it in.

By the next year, Peck was back in the Cordillera Real, but her luck worsened. A few hundred feet from Sorata's summit, Peck found herself tottering on a snow bridge over a crevasse. Turning around, she found that her two male companions had vanished: "I saw, to my horror and disgust, the rope trailing idly in the snow." She was forced to descend.

Peck turned her attention to Peru's Huascarán, which she thought might be the highest peak in the hemisphere. Her two assaults on the mountain failed, her poor choice in companions having done her in again. A lesser mortal would have toweled it, but Peck was no such thing. In 1906, she made another unsuccessful attempt. Then, a couple of weeks after being thrown by a mule and fracturing her ribs, she organized, almost as a lark, an expedition to the upper reaches of the Marañón in the Cordillera Raura to find the source of the Amazon.

But Huascarán remained her goal, and she came back to Peru in 1908. She reached what she thought was the higher north peak—she calculated it at 23,000 to 24,000 feet. But she was off: The north peak is

22,205 feet, several hundred feet lower than the south peak.

Still, considering her misfortunes with faint-hearted men and her age (she was fifty-eight), the ascent was a formidable accomplishment. The Peruvians named the north peak Mount Peck in her honor.

Peck's first book, *A Search for the Apex of America* (1911), is a stirring account of her Andean climbs. But her adventuring was not over. She went on to write South American guidebooks and, at age seventy-nine, set off on a seven-month airplane tour of the continent, which resulted in *Flying Over South America: Twenty Thousand Miles by Air* (1932). Peck died in 1935 at the age of eighty-five. Her life is chronicled in Elizabeth Fagg Olds's book, *Women of the Four Winds: The Adventures of Four of America's First Women Explorers* (1985).

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HANDCARRIES WANTED: Don't go to Lima or Quito empty-handed. We are always looking for people to carry library books, magazines, equipment, etc. If you think you will have some extra room, contact: South American Explorers Club, 126 Indian Creek Road, Ithaca, NY 14850; Tel: (607) 277-0488. (CL)

HOUSE FOR SALE. In Banos, Ecuador. Danish built in 1995. Sits on a hill overlooking town, surrounded by lush vegetation. B&B possibilities or a great writing/art/living space. Fairly priced at $34,000. Call Melanie @ (612) 439-8474 for more info. (53)

KEEP US INFORMED! Remember how vital those TRIP REPORTS were to your last sojourn to Machu Picchu, your dissertation on Patagonian penguins, your tour of the Pantanal on horseback? Call, write, e-mail, or fax the SAEC for blank trip reports.SAEC: explorer@samexplo.org. 126 Indian Creek Rd, Ithaca, NY 14850. 607-277-0488. (CL)

Continued from page 19.

bers, lobsters, and other species without restriction. Furthermore, sport fishing became legal in 1995, posing a danger to shark, tuna, and dolphin fish populations. This move toward exploitative activities and away from minimal-impact activities (nature watching, photography, etc.) sets a dangerous precedent.

Fishermen can cause harm to the islands beyond their commercial activities. They set up illegal camps, often bringing in dogs, cats, and goats. Some animals escape and become feral: a dog was sighted on Fernandina; a cat on Venecia. Fishermen discard fruits and vegetables and inadvertently introduce rats, ants, and other alien species. Domesticated vegetables were found growing near an abandoned campsite on Fernandina. On Fernandina and Isabela, the fishermen cut down mangroves to hide their equipment and dry sea cucumbers. These mangroves are the only habitat of the Mangrove Finch, the rarest of Darwin's finches. The Charles Darwin Foundation has found that over 500 sites show signs of illegal camping by fishermen. The observations on Fernandina are particularly disturbing, because Fernandina is the largest island in the world still free of introduced vertebrates. History abundantly documents the grim fate of native species once aliens are introduced to an island ecosystem.

Charles Darwin could ride a bucking tortoise and throw iguanas into the sea.

In attempts to solve these problems, the Ecuadorian government closed the sea cucumber fishery. The president vetoed a law that would have significantly reduced protection of terrestrial and marine environments. The government has appointed a commission to come up with new laws to protect the Galápagos. The Galápagos National Park Service has been equipped with a new high-speed patrol boat and is stepping up patrol and enforcement of park regulations. In January 1996, eight sea cucumber fishermen were arrested on Isabela. Since then, more arrests have been made, several illegal fishing camps raided, and at least one boat seized. But relentless political and economic pressures to sacrifice the Galápagos for short-term gains will continue. The government must be convinced that the long-term economic benefits of carefully managed tourism far outweigh the short-term benefits of exploitation.

I fear for the future of the Galápagos.

One hundred and sixty years ago, Charles Darwin could ride a bucking tortoise and throw iguanas into the sea. Today, I can photograph tortoises and iguanas, but cannot touch them. I can only hope that in another hundred and sixty years, my descendants will still be able to see these tortoises and iguanas, and the other remarkable wildlife of this unique and wonderful place. I fear for the future of the Galápagos.

*All quotations of Darwin are from the first edition of *The Voyage of the Beagle* (1839), unless otherwise indicated.

Lima Club

We're sorry to have to issue the following warning to those Club members headed to Cusco: A wave of strangle muggings has continued unabated. We recommend using taxis after dark, even if the travel distance is only a couple of blocks from the Plaza de Armas. This advice goes for both woman and men, as the attacks have been indiscriminate. Victims have been targeted even when walking in groups of two or three.

At least six SAEC members have been attacked in the last 12 months, and we have received reports of similar muggings, occurring almost on a weekly basis. The attacks appear to be perpetrated by a professional gang, or gangs, operating in groups of three or more. Most of the muggings occur within a six-block radius around the Plaza de Armas after 10 p.m., and are carried out with proficiency. We have not heard of anyone being seriously injured or sexually molested. Victims have all reported a similar scenario, in which they were ambushed and had no time to react.

"I was walking with a male friend at 12:20 a.m. on a well lit street, Calle Choqechaka, in the neighborhood of San Blas," one female member told us. "We noticed a man behind us, then a blue taxi passed us and let off two guys. When we passed, the two guys came at us with a gun. I tried to give them my bag and the other man came from behind and began choking me hard...I was struggling to breathe and then I lost consciousness."

After being pistol whipped, her friend was also choked into unconsciousness and robbed.

Victims and business owners alike have complained that response by local authorities has been completely inadequate. No effort has been made to patrol the back streets around the Plaza de Armas, they say—a seemingly logical strategy, given the obvious pattern of the crimes.

On June 19, Clubhouse staff and members of our Board of Directors in Lima met with representatives of PromPeru, the government-run tourism bureau. A pledge was made to work with the Club to track these crimes, monitor police response, and take steps to establish neighborhood watch programs around the Plaza de Armas.

What can members do? If you have been the victim of such a crime, or know someone who has fallen victim, please contact us here in Lima:

SAEC
Postal: Casilla 3714
Lima 100, Peru
Tel/Fax: (511) 425-0142
e-mail: montague@amauta.rcp.net.pe

Members should copy your letters, email or faxes to PromPeru Spokeswoman Alessia Di Paolo:

Alessia Di Paolo
Responsable de Prensa Area de Turismo
Fax: (51-1) 224-2660;
Tel: (51-1) 224-3396
Address: Edificio Mitinci, Piso 13
Calle 1 oeste S/n
Urb. Córpac, Lima 27 - Peru
Email: postmaster@promperu.gob.pe

The SAEC is urging the Tourist Police to launch an investigation and start nightly foot patrols. Unfortunately, police have taken an unofficial stand of "blame the victim," pointing out that the majority of incidents involve victims returning to their hotels after a night out dancing and drinking. Police also claim many crime reports they receive are false and are filed by tourists seeking to make fraudulent insurance claims.

For this reason, we need feedback from you to be as specific as possible: Where did the attack take place and when? What did the attackers look like? How did police respond?

It is not our intention to scare people away from Cusco. It remains one of the most enchanting cities in the world. Here is an opportunity for you and the Club to clean up Cusco.

Organized crime rings carrying out high-profile attacks, murders, and

kidnappings recently moved to the forefront of the national political arena. President Alberto Fujimori and his political party, Cambio 90—the congressional majority—won a debate in May to deem such crimes the legal equivalent of terrorist acts against the state. Besides meting out tough 25-year-to-life sentences to convicted gang leaders, new laws enacted grant special emergency powers to the military and intelligence service to deal with the crime wave.

Opposition leaders called the new measures an attack on the Constitution, and accused Fujimori of taking advantage of the problem to solidify his authoritarian regime as he prepares to run for a third straight term in 1999.

The Lima Times made a spectacular return to Lima news stands this May, and is back on track with monthly editions after a six-month reorganization. Headed by veteran editor Eleanor Griffis de Zúniga—a founding member of SAEC—the magazine is once again one of the best English language sources of in-depth political coverage, cultural features, and lists of tips and advice for travelers in Peru. Annual subscription rates are S/100 in Peru, or $65 abroad. For subscription information, contact Lima Times, Casilla 531, Lima 100, Fax: (011) (51-1) 446-7888, E-mail: perutimes@amauta.rcp.net.pe.

The Lima Clubhouse is currently looking for long- and short-term volunteers. Cool people. Cool job. Perks. Much fame, but little fortune.

Thank you, thank you, thank you to members Roman Nelson, Aileen Martin, John Leivers, Eli Merritt, Laurio Ingenick, Al Yates, Jason Ingram, Jan Heisey, Michael Ward, and Ken Fang for your assistance with handcarries. We really appreciate it.

Quito Club

Colombia and Ecuador held their respective Presidential Elections on May 31. In Colombia, months of scare tactics by a variety of guerilla and military groups disrupted the voting process and agitated the general public. In Ecuador, presidential candidates ranged from a member of the "richest family" to a representative of the Indigenous Party.

At press time, the two main candidates in Colombia, Serpa and Pastrana, were neck and neck. In Ecuador, the vote was split between Mahuad and Naboa.

If you have tried to contact us to no avail by phone or fax in May and June, we're very sorry! Our phone lines have been down for weeks, and as of this writing, we are still waiting for repairs.

Our membership continues to provide us with wonderful volunteers but we are always looking for more.

The Quito Clubhouse project at La Tola Centro Campesino is in full swing.

The Quito Clubhouse project at La Tola Centro Campesino is in full swing. During four excursions, volunteers and children from La Tola went fishing, wading through rivers, hiking in the parks, and bathing in the hot springs. Any one wanting to offer donations of time, clothes, school supplies, outdoor equipment, or money, please contact the Quito Clubhouse.

Talk to us when you are here! There are always opportunities for the right person at the right time. As well, we thank everyone who has helped us with handcarries from all over the world. Hats off to the members!

Scott Hoyer

Scott Hoyer died May 24, 1998 at age 35. Scott was the writer of "Bushwhacked on the Guyana Trail" published in Issue 51.

We didn't know Scott very well, but pleased with his first article, we were fondly rubbing our hands, joyfully anticipating a whole series of articles by Scott from South America. For those who may not remember his piece, read on:

I gaze longingly across the dull green Tacatu River and listen to a very-low-on-the-totem-pole Policia Federal explain why he can't give me a Brazilian exit stamp:

"There's no ink in the stamp pad," he says. "We asked for a new one a couple of days ago, but it hasn't arrived."

"Really? Then what do you do with people who want to go to Guyana?"

"You're the first person in two weeks who's wanted a stamp. All the rest were just going for a few days so it wasn't a problem. I think it's no problem for you as well."

"Maybe not to cross the border, but I plan to go up to Georgetown and then re-enter Brazil from French Guiana.

The Federal Police are certainly going to wonder where I've been between Leticia (Colombia/Brazil) and Oiapoque (French Guiana/Brazil)."
"Hmm. Maybe you should go back to the Federal Police office in town to get a stamp." (Bom Fim is a three mile hike.)

"I was just there. They told me that exit stamps are only issued here at the frontier."

"Then you have to return to Boa Vista to get one." (A four hour bus ride.)

Neither option is practical.

"O.K., how about you just write in my passport that I left here on this date and sign it?"

"No, I can't take that responsibility. You have to go back to Bom Fim or Boa Vista."

"Then, how about I just write it myself and you sign it?"

"No."

"Fine. I'll just do it myself and you be a witness. Got a pen?"

His pen is also out of ink. My pen got swiped in a market in Manaus. I grab a pencil stub and scribble the essentials. "What's your name? I'll even sign it for you."

He raises an eyebrow, lights a cigarette, and busies himself with a meaningless ledger. I forge the name of the Brazilian consul in Iquitos.

The boat landing on the Tacatu is a washed out section of riverbank with a wooden sign that reads "barco" nailed on a tree. I feel an urge coming on to complete my clandestine entry into Guyana by swimming across the river. I resist it. Instead, following instructions, I spend a few sultry minutes wading around the shallows hollering "Barco! Barco!" Finally, a barely motorized dugout splutters into view and ferries me to Great Britain's former toe-hold on the Americas.

The author of such lines was someone worth knowing. Our regrets to all who knew him better than we.

Nicole Maxwell

THE FIRST *GRINGA* WITCH DOCTOR'S APPRENTICE

Nicole Maxwell was a former medical student of Ohio State University School of Medicine. In a long career in several South American countries, Nicole collected and cataloged more than 500 plants used by native groups to cure a wide range of diseases and injuries. A fellow of the Royal Geographical Society and an active member of the Society of Women Geographers, Nicole was twice appointed research associate of the Museum of the American Indian. She authored Witch Doctor's Apprentice *and numerous magazine articles. Nicole died on May 5, 1998 at age 92.*

Connor Nixon writes:

Nicole chewed on life with great glee. Even at 60, her hands gnarled with arthritis, she could still lift a leg over her head in a ballet exercise.

Some missionary friends in the Amazon jungles of Peru first introduced my wife and me to Nicole. We owned a tourist lodge at the time and hoped to offer a medicinal plant tour to our guests.

We hired Nicole to put together a list of plants that grew near our lodge and describe their medicinal properties. It wasn't long before I found myself laughing with, angered by, learning from, and truly astounded by Nicole.

During Nicole's stay with us, she brought the lodge to life, holding court each evening. She would launch into a riveting tale and let the tension build until she had her audience hooked and hanging on her words with breathless anticipation. At that moment, she would lean back and proclaim to one and all, "I'm dry." On cue, one or more guests would jump up and flag a waiter to freshen Nicole's pisco sour. To hear a whole story from Nicole, a listener had to make sure refreshments flowed without interruption.

One morning, Nicole appeared flushed and furious. Someone had stolen her something or other. It turned out she had scolded one of our staff the day before. To get even, he had jokingly hidden whatever it was to get even. Unappeased, Nicole confronted this fellow in public. She threatened to have a *curandero* put a hex on the prankster that would cause his most valued body part to "rapidly fall off—never to return." The young man left immediately, not stopping even to collect his pay. He never returned.

Long before ethnobotany became popular, Nicole explored the jungles for herbal medicines with an attitude we all loved. I can see her now..."Look here, St. Peter. Take this root three times a day and you'll have no more tooth problems and your hair will grow back."

Brigid Imrie

SEPTEMBER 8, 1966—FEBRUARY 24, 1998.

Brigid was diagnosed with brain cancer in July 1993 shortly after her return from Ecuador where she worked at the Quito Clubhouse in 1991 and 1992. Brig was such truly excellent company and will be remembered and missed by many for her kindness, keen intelligence, and wicked sense of humor.

Brigid died in February of this year.

Nicky Johnson speaks for us all when she writes:

"I think that the depth of the sorrow and loss we all share indicates the joy and delight Brig brought to our lives and the number of people she touched.

Brigid had a passion for exploring other cultures and traveled extensively. She had a real love for South America, where we traveled and worked at the South American Explorers Club. Brig enjoyed the simplicity and rawness of life in Ecuador. She had a big heart and felt distressed by injustices and the misfortune of others.

During her illness, Brigid continued to live life to the fullest. Brigid *lived* with cancer—she did not want us to feel she was dying from it.

A short poem by Langston Hughes:

I loved my friend.

She went away from me.

There's nothing more to say.

The poem ends as soft as it began—

.....I loved my friend."

Maria Reiche

That the mysterious Nasca Lines in southern Peru still exist at all is largely due to the tireless efforts of Maria Reiche, a German mathematician who devoted half a century to studying the complex lines and figures. Maria fought almost singlehandedly for total protection of the lines and beat off many threats to irrigate the area or hold military maneuvers which would have obliterated this unique archaeological treasure. Maria Reiche died June 8, 1998. She was 95.

Fear and Roading in Paraguay

by Kevin Haight

No buses travel the unpaved stretch of the Trans-Chaco Highway from Mariscal Estigarribia, where the pavement ends, to Bolivia.

In roughly the center of South America, a bit down stream from the justifiably celebrated falls that bear its name, the Iquazú River empties into the much larger Paraná to form the boundary between Brazil and Paraguay. An impressive single-span bridge over the river connects the Brazilian city of Foz do Iquaçu with Ciudad del Este on the Paraguayan side.

Ciudad del Este is one of the great centers for smuggled goods in the western hemisphere. The city owes its existence to dozens of large "warehouse outlets" and hundreds of smaller stores crowded a couple blocks from the river, enterprises offering all manner of electronic gear, shoes, tobacco products, liquor, perfumes, clothing, building materials, motorcycles—you name it. Who buys it? Not your humble Paraguayans (those not wearing officer uniforms). These common folk can't afford such goods, even at the tax-free bargain prices. No matter. These goods are destined for that immense market just across the bridge: Brazil.

Like the tide, a flood of Brazilians in cars and trucks sweeps across the bridge in the morning and returns each evening with shopping bags and suitcases bulging with duty-free purchases. A

The stretch of road from Estigarribia to Bolivia is so trying that drivers rotate every hour or two.

I found myself in one of the dirtiest, sleaziest, most dangerous-looking places I'd ever come across in South America.

Kevin Haight teaches courses on The Incas and Their Empire at the University of Colorado and leads tours to Peru and elsewhere. He is also a lawyer, mountaineer, explorer, and writer/editor.

bustling Brazilian customs office sits on the Foz side of the bridge. Many are the stories of customs agents getting rich on bribes. So lucrative is a job in this customs house there's a rumor that high officials auction off inspector positions, with the post going to the bidder ready to kickback the most for his appointment.

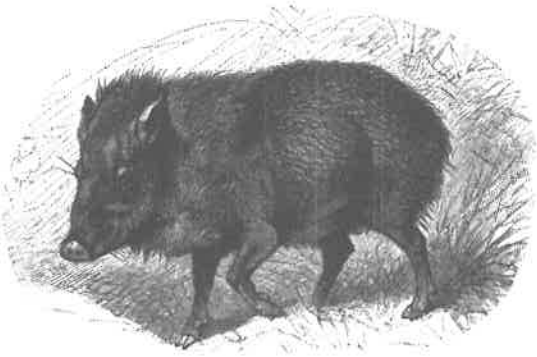
I wandered into Ciudad del Este en route to Itaipú, the world's largest hydroelectric dam, a joint Brazilian-Paraguayan enterprise. Alas, I arrived just as the first general strike in some forty years hit Paraguay. It shut down Itaipú and almost everything else in the country. If Ciudad del Este had been a charming town, I might have waited around a day or two for Itaipú to reopen. As it was, I found myself in one of the dirtiest, sleaziest, most dangerous-looking places I'd ever come across in South America. When the buses started running again that evening, I hopped aboard the first one out of town.

I'd come to climb Cerro León, Paraguay's highest "mountain." The exact elevation of this mountain is apparently unknown because (a) it's not very high, and (b) it's so far from anywhere that nobody cares how high it is. The four different maps I found listed four different elevations. These ranged from 750 m to 1000 m. I strongly suspect that all four altitudes are guesses.

The problem with Cerro León isn't altitude. It's accessibility. Cerro León is in Paraguay's chaco, a dry tropical forest that blankets the northwest two-thirds of Paraguay, along with portions of southern Bolivia, southwest Brazil, and northern Argentina. Daytime temperatures hover in the 90's much of the time, which may account for why it's affectionately known to biologists and other scientists around the world as "The Green Hell." But things even out. Temperatures plunge to near freezing in the northern, higher-altitude parts of the chaco near Bolivia. Mennonite colonies cluster near the southeastern limits of the chaco. Here, rainfall is somewhat higher. Cerro León sits about halfway between the colonies and the Bolivian border.

armed with some combination of thorns, spines, barbs, nettles, or poisonous sap

In some high school geography books, the "chaco" is pictured as a tract of open grassland with a few large trees. In point of fact, these are pictures of the chaco's few ranches and farms. The real chaco is mostly low, extremely dense vegetation, trees and undergrowth some six or seven meters high. Every tree and bush is armed with some combination of thorns, spines, barbs, nettles, or poisonous sap. These defenses stab, lacerate, cut, and poke any man or beast trying to navigate a course through



the vegetation. And navigation is necessary. Except for a few areas, the chaco is as flat as a billiard table and covered with a forest so dense that without a compass you are lost minutes after leaving one of the few roads that cut through it. For this reason, even today large areas of the chaco have never been explored except by the Guaraní and other Indians who have lived there for millennia.

No buses travel the unpaved stretch of the Trans–Chaco Highway from the small military outpost called Mariscal Estigarribia, where the pavement ends, to Bolivia. On the dirt road, the slightest movement of wind or machine stirs up clouds of fine dust like Oklahoma during the dustbowl of the 1930s. But it's even worse when it rains. Then, the compacted clay turns into a tan slime that's as slick as motor oil. Even 4-wheel drive vehicles slither off into ditches and gullies, unable to steer on a surface as slippery as soapy tile. Vehicles unable to winch themselves out stay put until the ground dries. And when that happens, the clay hardens like concrete, and it takes crowbars and pickaxes to get them out.

If there is even the slightest chance of rain over the chaco, no vehicle ventures forth. But when it's dry, cargo trucks make the dusty 18-hour run between Estigarribia and Bolivia. Most trucks haul smuggled goods from Ciudad del Este, contraband much coveted by Bolivians who have the same desires, if not the money, as Brazilians. Here too, custom dictates payoffs to the officials at the numerous checkpoints in the middle of nowhere on both sides of the border. A smile, a wink, and a nod between truck driver and soldier—together with a bill of some large denomination—keeps traffic flowing over the ruts, ridges, holes, and washouts, and through the clouds of talcum-powder that together make up the "highway" between the two countries.

Customs inspections are handled by the military. There's a reason for this. Sixty years ago, Standard Oil told Paraguay and Bolivia that the chaco was sitting on a vast reservoir

of oil. Predictably, the two countries responded to this happy prospect by engaging in an indecisive war over who would get the lion's share. No oil was ever found. After the war, Paraguay and Bolivia agreed on a border between the two nations. The border passed through the chaco, previously considered too remote and difficult to survey.

taguás, an animal long thought to be extinct, were discovered romping around in Paraguayan chaco.

Cerro León is about 80 km off the Trans-Chaco to the east, and the same distance south of the Bolivian border. Maps of the area (except military ones too secret for civilian riff-raff) are spectacularly inaccurate when it comes to things like roads, rivers, landmarks, etc. Just to *find* Cerro León in the green ocean of vegetation, a knowledgeable guide is indispensable. Fortunately, I found Jakob Unger, an amateur naturalist living in Filadelfia. Unger makes his living as a building contractor. He spends a great deal of his time, however, in the company of taguás, a species of wild pig.

About 15 years ago taguás, an animal long thought to be extinct, were discovered romping around in the heart of the Paraguayan chaco. Estimates at the time of discovery put the population at between one and three thousand. Taguás, unlike their two peccary cousins that range up and down the hemisphere from Arkansas to Argentina, are endemic only to a small area of the chaco. In theory, taguá habitat is within the Defensores del Chaco National Park and therefore protected. In actuality, taguás make a tasty meal, and, hunted eagerly by both Indians and whites, they are in grave danger of extinction.

When the San Diego Zoo learned of the near-extinct taguá, it took immediate action. With the blessing of the Paraguayan government, the Zoo purchased a former cattle ranch near Filadelfia, captured about twenty taguás, and launched a research and breeding-in-captivity program. The plan was to raise taguás and when the herd reached about fifty animals, ship thirty of them to various zoos in the United States and elsewhere as a reserve in case all of Paraguay's taguás disappeared—a not unlikely prospect. In all, the Zoo spent some $250,000 on the project. After a couple years Unger, who had been with the program from the beginning, took over as manager.

a quarter million good dollars on a bunch of dumb ugly pigs

All went well. By 1994 the herd numbered fifty. Since taguás were an endangered or at least threatened species, however, American authorities balked at letting them into the United States without the written permission of the country of origin. Applications soliciting permission were duly submitted to the appropriate Paraguayan authorities. Surprisingly, nothing happened. The applications were neither granted nor denied, which of course amounted to a denial. Every follow-up inquiry was greeted with increasingly flimsy and spurious explanations to account for the bureaucratic inertia.

Gradually, and only indirectly, the truth emerged. The Paraguayan

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WHITE WATER IN ECUADOR

We'd turned off onto a side road—it looked barely traveled.

authorities might not know exactly what the *yanquis* had up their sleeves, but they knew deep down that these taguás meant money. Why? Because not even gringos would be so foolish as to spend a quarter million good dollars on a bunch of dumb ugly pigs unless they were going to get their money back and hefty profit to boot. After all, wasn't that what *yanquis* had been doing in South America for almost two hundred years, making a killing from coffee, bananas, cocaine...and now pigs? The Paraguayan politicos were not about to be hoodwinked this time around, small-potatoes operation though this might be. Those pigs weren't going anywhere unless the big shots got cut in for their piece of the action. For its part, the San Diego Zoo felt it was just protecting an endangered pig, and it wasn't about to pay off anybody. The last I heard, the Paraguayan government was still stonewalling. While the standoff continued, the herd of taguás continued to grow slowly under the conscientious ministrations of Jakob Unger and his family.

"I'm sure they're CIA," he said.

Junger gave me a tour of the taguá farm, pointing out the ruins of bunkers, trenches, etc. dating back to the Chaco War with Bolivia. Then we climbed aboard his 4-wheel drive truck and drove to Cerro León. From our camp at the base, our ascent took all of fifteen minutes. The next day, Unger took me back to Estigarribia to wait for a truck bound for Bolivia.

And wait I did, hanging out in an alleged hotel, the only building in town that wasn't either military or private. The hotel was owned by an expatriate German, a storehouse of local history, or at least rumor. He professed to know the truth about what the Americans were up to when they arrived in sleepy Estigarribia a couple years ago.

"I'm sure they're CIA," he said. "First, they expanded the Paraguayan Air Force base. And then they lengthened the runway. Now it's five kilometers long!"

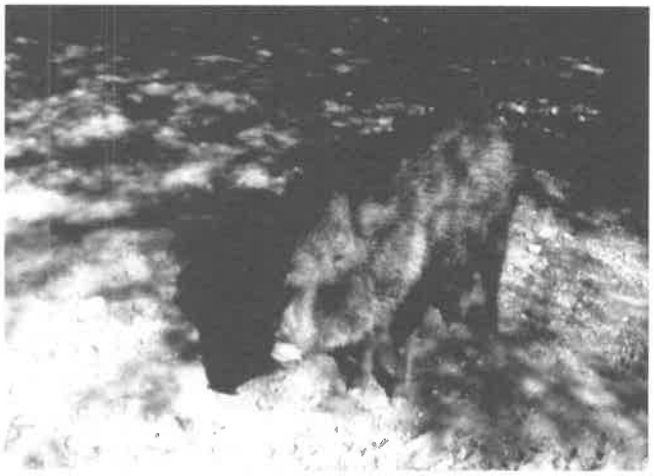
"Why would they need a runway that long?" I asked. "Not even the space shuttle needs a runway that long. And why in the middle of Paraguay?"

"AWACS," he explained. "I've seen them taking off and landing."

"But AWACS don't need anywhere near five kilometers of runway."

He shrugged. "From here, AWACS could monitor all air traffic and communications from the Caribbean to Patagonia, from the Atlantic to the Pacific. Maybe they've got something to do with your government's idiotic war on drugs."

I walked out to the air base the next day. I could see only part of the runway through the fence around the perimeter, but it was obviously (a) spanking new; (b) far and away the smoothest piece of paved real estate in the whole country; and (c) unbelievably long. The next day I walked along the Trans-Chaco north of town. A few kilometers out, I noticed a compound of several new, neat, red brick buildings. These all were set well back from the road at the end of a driveway that snaked around the trees for no apparent topographical reason. If it served any purpose, it did make the compound harder to see unless you left the road and drove toward it. The brick buildings of varying size looked much like a small college campus in, say, Pennsylvania. Curiously, there are no red bricks, or even the material to make them,



When taguás, long thought to be extinct, were discovered in the chaco, estmates put the population between one and three thousand.

within several hundred of miles of Estigarribia. It all made you wonder if there wasn't some connection between the brick compound and the inexplicably long runway.

It was Friday the 13th.

I waited in Estigarribia. Nary a vehicle appeared from either direction for four and a half days. Reading the hotel owner's *History of the Mennonites in Paraguay* did little to reduce the lethal tedium. Finally, I got a ride on a 2 1/2-ton Bolivian stake truck that had sides but no roof except for a tarp that slid along a pole running down the center. Two drivers and a mechanic made up the three-man crew, a number deemed essential to traverse the obstacle course between Estigarribia and Bolivia. This stretch of road is so trying that drivers rotate every hour or two, and most trips require the services of a mechanic at some point(s) or other.

My three-man truck crew, however, looked like they'd be more at home cutting throats with Blackbeard or shooting it up with Pancho Villa—and were clearly not the sort of folk you'd want to run into in a dark alley. I had serious doubts about entrusting my life to such an array of scars and missing teeth. Then, too, this trio was no doubt carrying something more than the stacks of plastic dishpans and cartons labeled "blender" and "coffee grinder" piled high in the cargo area. I'm not particularly superstitious, but I did note an ominous sign: It was Friday the 13th.

I looked around at some of the other passengers: a soldier, perhaps going home on leave, a young couple, maybe newlyweds, and a genteel, elderly, white-haired lady in an expensive riding outfit who looked rather out of place perched atop a pile of

Jakob Undeer, manager of the taguá research and breeding-in-captivity program.

plastic dishpans. If she felt safe chauffeured by these three graduates of the Don Corleone School of Effective Persuasion, it must be all right. Besides, if there were trouble I could use her as a shield.

As the truck pulled out, we passengers hunkered down, molding ourselves in and around the cargo. With handkerchiefs tied over nose and mouth to filter out the dust, we all looked like bandits, even the old lady.

Rumbling out of town at about 20 kph, we bounced over craters, swerved around benches, maneuvered over collapsed bridges, and avoided other obstacles familiar to travelers of the Trans-Chaco Highway. Peopled climbed aboard or jumped off at the few cattle ranches laboriously hacked out of the forest. I was particularly sorry when the old lady got up to leave. I felt the truck crew would be less likely to do us in as long as she was around. She dismounted from the grubby, dusty truck with imperturbable dignity and a smile for the rest of us. Ah, well...it was broad daylight, and the soldier didn't look worried. If the three brigands were plotting some foul deed, surely they'd postpone their skullduggery until it was dark and we'd crossed the border.

From the celebrated Iguazú Falls, the Iguazú River empties into the much larger Paraná to form the boundary between Brazil and Paraguay.

I caught them furtively sizing me up.

The truck ground to a halt at one of the ranches where a *cantina* dished out something that passed for food. The crew hunched around a separate table, whispering to each other. When they occasionally caught my eye, they leered their gap-toothed grins but when they thought I wasn't looking, I caught them furtively sizing me up.

Back riding in the truck, the hours dragged by, the unchanging landscape punctuated only by swarms of huge locusts. Until some landed in the truck and I could see them for what they were, I mistook them for small birds. These weren't your Kansas grasshopper. About 7 or 8 cm long, they weighed in at a whopping 2 oz apiece. Several million of these could make short work of Paraguay's annual agricultural output, an event which indeed has happened many times during the past century.

They just *looked* evil.

As we approached the border, the passengers thinned out, and by the time darkness closed in I was the only one left. The map showed a couple more Paraguayan military checkpoints ahead and the border a few miles beyond.

To be fair, the crew so far hadn't actually done or suggested anything underhanded or threatening. They just *looked* evil—bad enough that I felt a need to hide my cash. It wasn't a great amount, only about $200 in U.S., travelers checks to the tune of $400—no good to thieves—and perhaps $100 in miscellaneous South American money. But in Bolivia, with an annual per capita income of about $700, it represented a tidy sum.

Aside from an ice ax and ski poles, I was unarmed, but even with a knife, I'd have had little chance against the three of them. Of course, I was wearing a money belt. This is good enough protection against a pickpocket but of little value when faced with a robber who can leisurely search his bludgeoned victim.

Clearly, I needed a plan. I took out $250. Finding the money belt might satisfy my assailants if they decided to roll me. The $250 I balled up as tightly as possible and stuffed down my undershorts. Of course, the ruffians would rifle through my pants, shirt, backpacks, boots, etc. There was a chance, though, that they might find pawing my underwear distastefully intimate, especially if they already had my money belt. Admittedly, it was hardly a strategy worthy of the cunning Ulysses, but it was the best I could come up with in the desperate circumstances.

After a couple hours jouncing along the pitted road, darkness fell. It turned cold. I fashioned a makeshift tent out of the tarp to keep warm. Shortly thereafter, the truck stopped out in the middle of nowhere. All was silent, the darkness total except for a scattering of stars. My heart pounded when I distinctly heard both cab doors open. Panic set in as I glimpsed the dim form of the mechanic clambering up the side of the truck. But instead of brandishing a monkey wrench or hammer, he was toting a couple of thick blankets and smiling, sort of. He'd come, he said, to stretch out for a few winks. The second door I'd heard open? The driver had gotten out to water the grass along the road.

I settled down. The lurching resumed. At length, we approached the border area. At each of the three checkpoints, everyone, crew and passenger alike, had to climb down while documents got checked, the truck inspected. The drivers stiffly stretched their legs. The mechanic and I climbed out, shivering from the cold and cramped from the trip. The "inspection" process ended abruptly as soon as money changed hands. That done, we all climbed back in, drove to the next checkpoint, and repeated the ritual.

A body might never be found.

We had crossed the border into Bolivia. It was about midnight. Suddenly, troops bolted out of the darkness on both sides of the road, surrounding the truck, yelling loudly, rifles raised, shooting off blinding flares, and firing into the air. There'd been no warning this time, no pole across the road, no sign, no lights. This is known as a Bolivian "ambush" checkpoint. High drama. But all the fireworks, guns, and yelling didn't faze my truck crew one whit. They calmly dealt with it, behaving exactly as they had at all the other checkpoints.

I frisked myself frantically while trying not to wake the mechanic.

Then, several kilometers down the road, I got the feeling my time had come. This was the moment and place for the bad guys to do their foul deed. We'd turned off onto a side road. In the ragged light of the headlights, the road looked barely traveled. No light was visible. A person robbed and cast out could wander about for days and, if stripped first (a practice favored by South Ameri-

can robbers), might well freeze to death. A body might never be found.

Again my heart raced. I held my breath, my ears taking in every sound, all senses on full alert. But nothing happened. The truck rumbled on. I calmed down. Perhaps my fears were unfounded. Maybe I chose to see evil where there were only ugly faces. Still, I was glad for the underwear strategy. So, while the mechanic snored gently next to me, I smugly slid my hand down to pat my cache. Gone! It was gone! I frisked myself frantically while trying not to wake the mechanic. I patted the floor in the darkness. Nothing. Not a single bill. I switched on my head lamp, and shading the beam, searched every nook and cranny. Nothing. Nothing at all.

What had happened? Piecing it all together, I concluded that somehow, in climbing in and out of the truck at one of the four checkpoints, my wad had worked itself loose and fallen out. It was probably right now being fingered by some jubilant border guard.

As I lamented my loss, I grudgingly had to concede a certain poetic justice to it all. Had I simply outsmarted myself? Maybe this was my just desserts for harboring those uncharitable and baseless suspicions about the truck crew who had done nothing more than transport me safely through the dark night.

We weren't moving. I must have dropped off to sleep. Suddenly—noises. One of the drivers called up. We'd reached Boyuibe, some 75 miles inside Bolivia. It was 3:30 in the morning.

I decided to 'fess up, tell the crew I'd lost the $250. What the hell? If they found the money before I did and pocketed it, I'd be no worse off than I was now. If they returned all or part of it, I'd be ahead of the game. "It fell out of my, uh, pocket somewhere, possibly in the truck," I said. All three perked up at this news, eager to help. With flashlight and head lamp, we made a thorough search of it. No money. If one of the crew found anything, he didn't let on.

After the money search, the driver said they'd be going on toward Tarija. I'd have to take a right for Camiri. With that, the truck drove off into the darkness, its one tail light hardly visible in the swirling dust.

There was something eerie about Boyuibe. I stood at the intersection of what appeared to be a main street surrounded by the usual houses, buildings, and street lamps. But all was totally dark. No street light burned, not a single sign or billboard lit the darkness, no light shone from any house. Had they turned off the electricity as dawn approached? Whatever the reason, it was pitch black.

But stranger still was the silence. Normally, a large truck pulling into town would have set off every dog and rooster for blocks around. But here, nothing—a ghostly silence.

I turned right onto the main street and walked toward a low hill. In the distance, the sky glowed. I trudged on toward some distant lights—an army base. The drowsy troops on guard jumped up as I emerged out of the darkness—a grandfatherly gringo lugging two backpacks was not something they expected at 4:30 in the frigid predawn. They roused their lieutenant. He couldn't have been more than 19 years old.

Considering he'd left the comforts of a warm bed, the lieutenant was surprisingly courteous to me, an apparition who had appeared out of the dark in the wee hours of the morning. He was, naturally, curious to know how I happened to be in Boyuibe at such an ungodly hour—Boyuibe, Bolivia being about as remote as you can get in South America. I explained, and in the end, he stamped my passport, certifying my legal entry into the country. This stamp can be very important later on should you ever have to prove, when leaving the country, that your entry was legal.

That done, I had to satisfy *my* curiosity. Why was the whole town of Boyuibe pitch dark and silent? The lieutenant laughed. "Oh, that's *old* Boyuibe you walked through. It was abandoned a couple years ago. No one lives there anymore. Everybody moved to new Boyuibe. New Boyuibe is a kilometer north of here."

I asked his permission to sleep a few hours on the ground outside the guard shack, till new Boyuibe came to life. "Oh, no," said the lieutenant. "It's time for me to get up anyway. Use my room. I'll make sure no one disturbs you."

I finished the very long day and night in blissful sleep on the lieutenant's cot. Paraguay was behind me.

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A ride on a 2 1/2 ton Bolivian stake truck that had no roof except for a tarp that slid along a pole running down the center.

Culture Shock! Bolivia

Mark Cramer

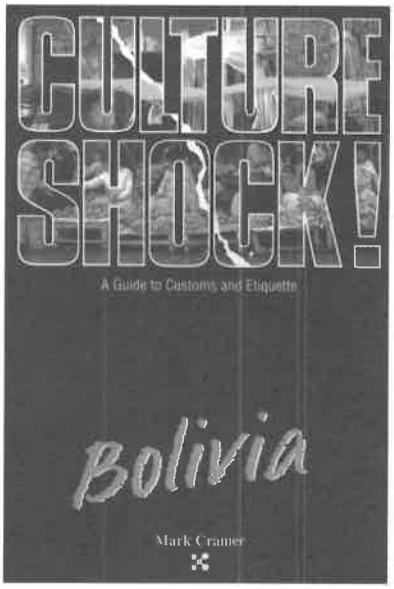
Portland, Oregon: Graphic Arts Center Publishing Company, 1996. 244 pages, paperback. $16.95

Bolivia has secret charms. Protests are free street theater. Celebrities are so accessible there are no gossip columnists. Sidewalk vendors are open-air shopping malls. According to Mark Cramer, an American who writes for the *Bolivian Times* in La Paz, these are just a few of the reasons to visit the Andean republic. It's also inexpensive, criss-crossed with spectacular trekking trails, and home to *jaconta*, a hearty soup made with lamb bones, rice, *chuño*, cabbage, carrots, and whatever else is in the larder.

Culture Shock! Bolivia is one in a series of guides to the "customs and etiquette" of some 40 countries. This is the first Latin American volume. Cartoons by someone identified only as "Trigg" enliven the text.

Traditional handbook fare—hotels, restaurants, and the like—takes a back seat to topics such as apartment renting, the coca culture, "tours for people who don't like tours," the art scene, prostitution, *kollas* vs. *cambas* (highlanders vs. lowlanders), and cocktail party comportment. Among the ten tips from *Paceños* are how to combat tear gas at demonstrations (bring a wet handkerchief), where to go to watch the sunset (La Ceja), and how to find a program for a soccer match (buy a newspaper the day of the game).

Anticipating the visitor's bumpy adjustment to life at 12,000 feet, Cramer deconstructs the world of *mate*: Best known is *mate de coca*, the standard remedy for altitude sickness, but Bolivia also brews *mate de manzanilla* (chamomile tea) for those suffering from dehydration, and *mate de anis* (anise tea) which soothes the bloated stomach. For the truly enfeebled, Cramer suggests *trimate*, the trifecta of herbal infusions.



—Daniel Buck

Harriet Chalmers Adams: Adventurer and Explorer

Durlynn Anema

Greensboro, North Carolina: Morgan Reynolds, Inc. 1997. 112 pages, hardcover.

Harriet Chalmers Adams traveled all over the world and was a very interesting lady. This book tells all about her life and her adventures. I guess it was pretty incredible in the 1900's for a woman to go to South America like she did.

Harriet spent two and a half years in Central and South America and traveled over 40,000 miles. I liked the part where she and her husband Frank slept next to the llamas high up in the Andes Mountains. They were riding the trail when night fell. They were cold and didn't know what to do. Then Harriet spotted the llamas and decided they would make nice, comfortable beds. It sure sounds like it would have been a warm sleep.

It was sad when Harriet's pet huron (that's some kind of small creature found in South America) died from a poisoned piece of meat in the jungle. Harriet almost died from the poison, too, but the Native People saved her.

It seemed like she had so many adventures! When vampire bats bit all the men and animals, she tied her scarf around her neck and was saved. When vine roots started climbing up her legs, she woke up just in time. All her adventures sounded like fun, even the scary ones!

I liked all the places Harriet traveled. It was interesting to read about them. But when the book told about how she lectured on her travels, it wasn't that interesting.

Seeing the picture of Harriet with Amelia Earhart was great! Harriet

was giving Amelia a medal. I guess Harriet met all kinds of famous people.

The pictures add a lot to the book. There's a picture of Harriet's house where she grew up in Stockton, California and a picture of her husband Frank. The pictures of some of her animals include llamas and a rat-like thing called a solenodon.

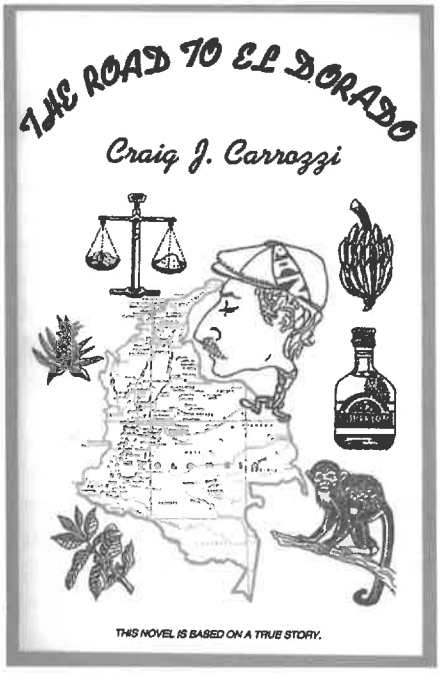
Harriet is really pretty in her pictures. I wonder how she could have been so brave in the jungle.

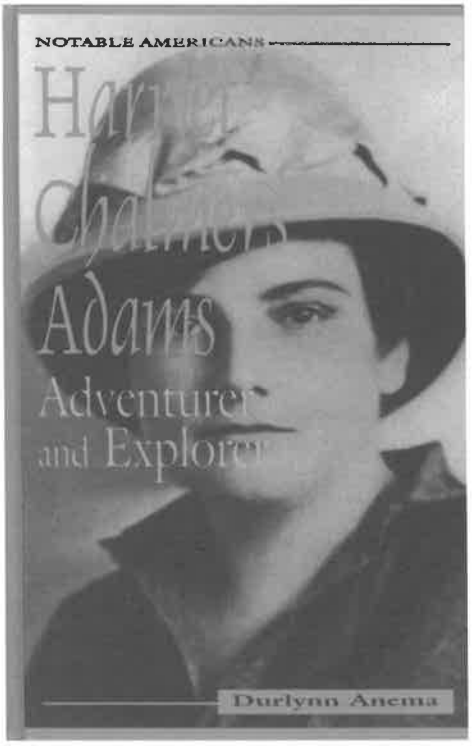
I think anyone would enjoy this book, not just children my age. I know many adults who read it and really liked it. It gives lots of information about South America and other countries. It even tells about World War I when Harriet was a war correspondent.

I recommend it—even if my Grandma did write it.

—Rachael Anema, age 12

To order this book, contact Morgan Reynolds Inc., 620 S. Elm Street, Suite 384, Greensboro, North Carolina 27406, Tel: 910-275-1311.





The Road to El Dorado

Craig J. Carrozzi

Southern Trails Publishing: San Francisco, 1997.
439 pages, paperback. $19.95

The Road to El Dorado is a "good news–bad news" story. The good news is that Peace Corps volunteers lived and served in Colombia for twenty years (1961–1981). The bad news is that the Volunteers weren't all perfect.

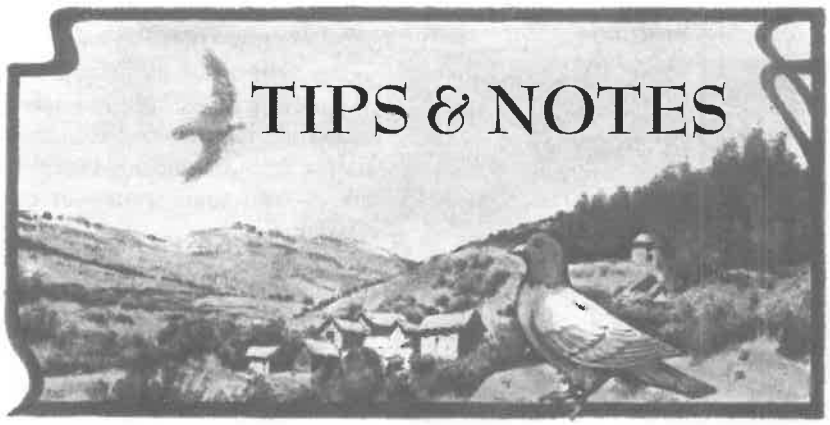
If you've ever been to Colombia, or if you've been a Peace Corps Volunteer, this book will suck you in and keep you reading. Carrozzi takes you through the first months of Gary Vachio's experience as a Volunteer just as drugs, kidnappings, and increased terrorism are heating up in Colombia and just before the Peace Corps terminates its program in that country. Although Vachio and others are committed to their assignments, the group does its share—and then some—of carousing.

Carrozzi uses dialog extensively and creatively. His descriptions will resonate with anyone who has spent time in Colombia. Whether it is the first swallow of throat-burning *aguardiente*, an encounter with the toughest of the troubled boys in the *juveniale* home, initiation of the only gringo in town, or a terrorizing walk in the streets of Bogota during early morning hours, Carrozzi grips the imagination and stirs the memory.

The story is fast-moving, tightly written, and poignant. Vachio is a real person from the first page, sharing fears, joys, loneliness, sexual desires, successes, commitment, friendships. Everything is seen through his clear sight and keen mind. *The Road to El Dorado* refers to searching for the gold of the conquistadors, the "white gold" of the powder variety, and the spiritual rewards of altruism. We're exposed to all of them. Indeed, Carrozzi's tale is excellent with far-reaching appeal.

—Patricia A. Ward

To order this book, contact Partners Book Distributors, 2325 Jarco Drive, Holt, Michigan 48842, Tel: 800-336-3137.



Ancestors of the Incas

Through Septmember 16, the The Pyramid in Memphis, Tennessee will display more than 300 artifacts from 35 ancient Peruvian empires. "Ancestors of the Incas: The Lost Civilizations of Peru" occupies more than 30,000 square feet of gallery space modeled after such architectural marvels as Chan Chan, the world's largest adobe city, and the Inca Temple of the Sun. On exhibit are incredibly preserved mummies, gold ceremonial artifacts, and excavated skulls that show evidence of successful ancient brain surgery.

See the "Ancestors of the Incas" web site at www.wonders.org for an interactive preview of the exhibit. If you're hooked, get tickets by calling 800-263-6744.

Up, Up, and Away

Reach Cusco and Machu Picchu in style:

Option 1: By cable car. In May, a consortium led by the hotel chains PeruHotel and Peru Operadora was awarded a 25-year contract to build and maintain a cable car that will be able to acccommodate up to 400 tourists per hour from the Sacred Bridge to the gates of the Machu Picchu Citadel. The $10 million project should be operational by October 1999. Under the terms of the contract, tickets will cost $10.90.

Option 2: Via hot-air balloon. New York balloonist Jeff Hall and his company, Globos de los Andes, started daily flights from Urubamba to Cusco, transporting passengers in six-story-high hot air balloons. "We're the highest balloon company in the world, altitude-wise," says Hall, a Buffalo, New York, native. "We're about 1,000 meters higher than the Swiss balloon companies. You can see the whole Sacred Valley, Pitsuray, Veronica, sometimes Salcantay."

Globos de las Andes has two balloons, both licensed by the Peruvian government and insured by GBH of London. Flights take off from the Hotel Resort del Valle Sagrado de Los Inkas. Regular flights cost $300, and a special "Adventure Package" is available for $350. For details, contact the hotel's e-mail: vsagrado@correo.dnet.com.pe, or Jeff Hall directly: globossa@aol.com.

Motion Sickness Relief

Tired of being the only one on the boat who turns green and dashes for the railing? Still wincing over that embarrassing moment when you spewed lobster bisque on your seatmate? Can't stand to remember all those beastly episodes when motion sickness did you in?

Now there's hope. Hope Pharmaceuticals has just introduced Scopace, the new prescription with scopolamine rated the "single most effective drug against nausea and vomiting caused by motion" by *Drug Information.*

Pop a Scopace pill and stroll casually on deck during turbulant seas. Saunter up the pitching aisle of your 727 while others clutch bags and go green. Give yourself up to the scary thrills of the Great American Scream Machine at Six Flags. Go beyond motion sickness.

Reach (not retch) for your telephone and call your doctor now. Need more information? Call Hope Pharmaceuticals at 800-755-9595.

Extra! Extra! Latin American News

U.S. Backs Off Banana Dispute With Colombia and Costa Rica

Guatemalan Farmers Throw Peas to Protest Spraying

Mexicans Arrest Top Drug Lord

Panama: First "Fat Cats" Arrested for Corruption

Although these stories probably didn't headline in your local newspaper, you can bet they did in the *Central America NewsPak* and the *Mexico NewsPak* compiled by the Human Rights Documentation Exchange. These bi-weely compliations of news articles on Central America and Mexico are clipped from major U.S. and Mexican newspapers. Both 12-page publications provide around 20 stories per issue and are a great way to follow current developments, trends, and events in Latin America.

Each *NewsPak* is $42 for a one year subscription; get both for $83/year. To order, contact the Human Rights Documentation Exchange at P.O. Box 2327, Austin, TX 78768, Tel: 512-476-984, Fax: 512-476-0130. ➢

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Tracy King, Jenny Remland, David Delgado & Dennis Richards in Buenos Aires

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- **Dennis Richards** *(Ft. Lauderdale, FL)*

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From Russell Edwards:

Looking for work teaching English in Quito, Ecuador? Try Key Language Services (KLS) at Foch 635 y Reina Victoria, Tel/Fax: 011-593-2-548-432, e-mail: kls@hoy.net. There's a lot of poorly paying and under-equipped schools and institutes in Quito, but KLS is an exception. If you have RSA Cambridge or TESOL qualifications, teaching experience, and are a native speaker, definitely get in touch with Ida Dolci, the Director of Studies.

From Gina Johnson:

If you're going Parque Tyrona Beach, Colombia, you can rent hammocks for about $5, hang them up, and spend the night in them. It gets rather cold at night, so bring sleeping bags. Also, stock up on food and water. A few words of caution: a) Watch where you hang your hammock! Apparently, five people a year die from falling coconuts! b) Beware of the strong currents; the day we arrived, someone drowned, and after that, about three people per day had to be rescued.

From Paul Cowling:

I camped on Isla Robinson Crusoe, Chile, a great way to visit on the cheap. LASSA Airlines flies a wobby 5-seat number from Santiago to the island airstrip; take their strict 10 kg luggage allowance seriously—I paid $21 for a 6 kg excess. I camped for free at the Lord Anson site, an adequate local with picnic tables and a pit toilet. Best to have a gas stove—gasoline is hard to come by, but the locals gave me benzene for free. Firewood available at campsite for open fires.

Do you have any tips you picked up during your travels? File trip reports! Mail us at South American Explorers Club, 126 Indian Creek Road, Ithaca, NY 14850 or e-mail us at tips&notes@samexplo.org. See your name in print and bask in other members' thanks and admiration.

The South American Explorers Club sells a host of other excellent guidebooks and maps of South and Central America, and cassettes and CDs of Latin American music.

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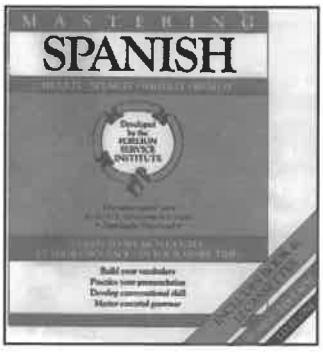

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Ronald Wright, Lonely Planet

Quechua is the ancient Incan language still spoken widely in parts of Peru and Bolivia. Learn how to say "Is it alpaca?" ("*Alpacamantachu?*"), "Please untie this horse" ("*Allichu kachariy kay kawalluta*"), "We want to buy a chicken" ("*Wallpata rantiyta munayu*"), and many more useful pharases. Pocket size, 96 pages.
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Brazilian Phrasebook

Mark Balla, Lonely Planet

A 96-page pocket phrasebook with a wealth of useful Portuguese phrases. Everything a traveler needs to know to make small talk, get around, find a place to stay, order food, bargain at markets, talk to doctor, and tell time. Second edition.
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Gary Bevington

The first general English language introduction to Yucatec Maya, this is just the book is for anyone wishing to communicate with the Maya in their native tongue. Covers pronunciation and Maya grammar with tips on learning "in the field." Includes essential words and expressions for common objects and experiences. Also a Maya/English/Spanish glossary with many examples of usage. See audio cassette below. Paperback, 240 pages. 1995.
$14.95 [Members $13.95] Item #371

Spoken Maya for Travelers and Students (Cassette Tape)

Recorded by Fernando Ojeda

This is a two-part, 30-minute cassette recorded by a native speaker. The two parts of the tape correspond to two chapters in the book **Maya for Travelers: A Guide to Language and Culture in the Yucatán.** Both book and cassette work very well together. 1995.
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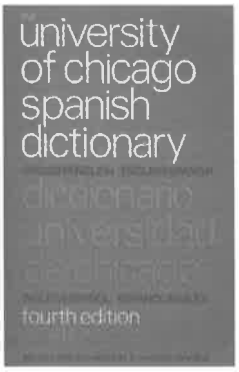

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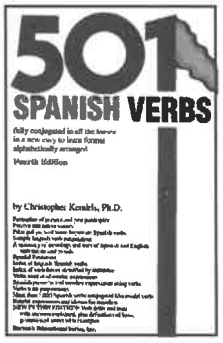

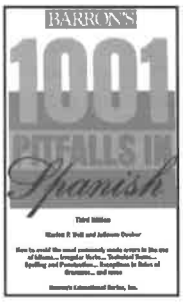

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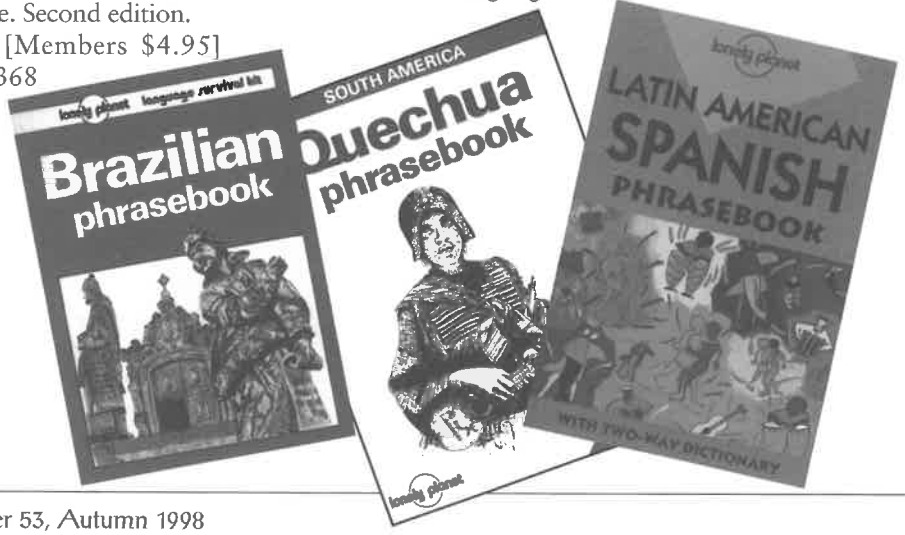

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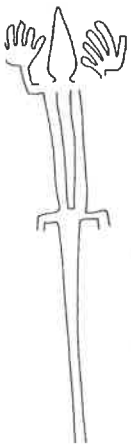

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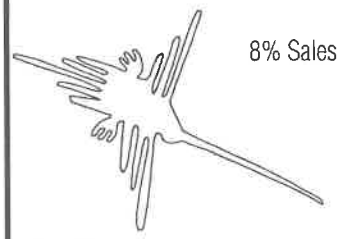

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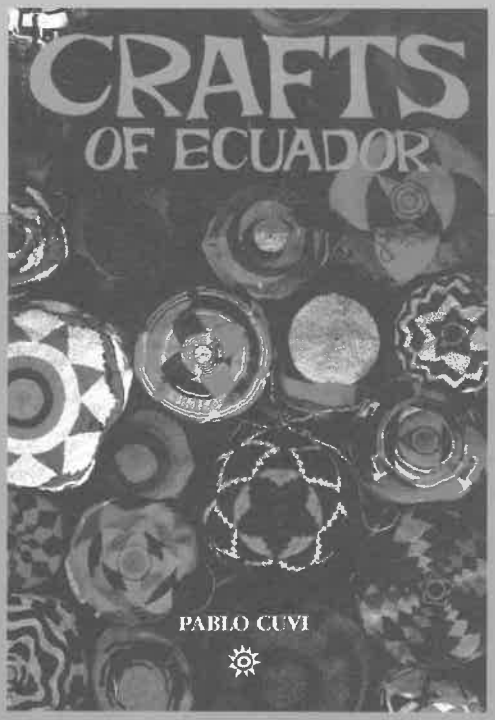

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